Special Climate Change Program 2014-2018

MÉXICO

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Special Climate Change Program 2014-2018

Special Climate Change Program 2014-2018
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Climático 2014-2018 (PECC 2014-2018)"

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Message from the President

Mexico has assumed with responsibility the challenge posed by climate change and has an international leadership as regards the development of a state policy to face such challenge.

We are aware of the global threat posed by this phenomenon and acknowledge it is necessary to have a decisive action from all nations in the world.

The Climate Change General Law and the Climate Change National Strategy: Vision 10-20-40 (ENCC) represent two columns on which we are building a whole National System to consolidate efficient institutions that help us reduce our vulnerability to this phenomenon and be able to develop a competitive, sustainable, and low-emission economy.

The Special Climate Change Program 2014-2018 is aligned to the National Development Plan, to the ENCC, and to the Sector Programs of the 14 Ministries of the Government which constitute the Inter-Secretarial Commission on Climate Change. In this way, the Federal Government meets its commitment to implement concrete actions to reduce gas emissions and green house compounds, and to increase our capacity to face the effects of this environmental, economic, and social problem.

Having a Strategy and a Program with objectives and actions to attain the mitigation of and adaptation to climate change effects makes our country one of the main actors assuming this challenge with greater commitment and responsibility.

We are transcending as a Nation; we must get Mexico on the move and take the country to its maximum potential and generate the conditions and consensus which allows us to create a better destiny for this and all future generations.

Enrique Peña Nieto
Constitutional President of the United States of Mexico

Message from the Secretary of the Environment and Natural Resources

The climate change phenomenon has ceased being a theory and is now a reality. Each day we witness the devastating effects of higher temperatures in our planet.

Although Mexico emits a low amount of GHGs, due to its geographical location it is highly vulnerable to the changes produced by these gases on climate. This is why we have made the commitment, as a country, to implement significant and immediate actions which combine climate change mitigation and adaptation efforts included in the Special Climate Change Program 2014-2018 (PECC 2014-2018) included here.

This Program is the outcome of the inter-institutional cooperation efforts carried out by the Government Ministries which form the Inter-Secretarial Commission on Climate Change which are by with the contributions from the society and the Climate Change Board. It includes 5 Objectives, 26 Strategies, 199 Lines of Action, and an Attachment on Supplementary Activities.

Moreover, specific actions are foreseen that are aligned to the guidelines of the Climate Change National Strategy Vision 10-20-40. Thus, it is oriented to reducing the vulnerability of the population, of productive sectors, the preservation of ecosystems, and reducing GHGs and short-lived climate pollutants prioritizing those sectors with higher emissions such as transportation, oil and gas, industry, agriculture, residues, and power generation.

With the publication of the PECC 2014-2018 and under the leadership of President Enrique Peña Nieto, Mexico will become an international reference on specific public policies and actions to face extreme meteorological phenomena due to climate change. Mexico has already witnessed the effects of these extreme phenomena and we must keep on making all efforts necessary to combat them for our population benefit .

Juan José Guerra Abud
Secretary of the Environment and Natural Resources

Message from the Climate Change Council

Climate change is already here. Since, according to the Inter-Governmental Panel on Climate Change, we have 95% certainty that man-induced emissions have been the prevailing cause of the warming since mid 20th century, if we fail to act now we run the risk of seeing unpredictable and potentially irreversible changes in the climate system. The quicker we act, the more options we will have to minimize these risks and limit the human and economic cost of this phenomenon.

The Climate Change Council acknowledges the efforts undertaken by the Inter-Secretarial Commission on Climate Change (CICC) in developing the Special Program on Climate Change 2014-2018 (PECC), which represents a first step to building a domestic policy which addresses the scientific recommendations on this area. The Board considers essential having a coordinated and transverse action of the Mexican Federal Government to ensure the efficiency of public policies to address this global problem.

Mexico is particularly vulnerable to climate change; therefore, mitigation and adaptation efforts must be a central concern for Mexico. To be prepared we must preserve ecosystems (and therefore, the services they provide us), stop deforestation and forest degradation, strengthen the adaptation capacity of cities and productive sectors, and protect our strategic infrastructure against extreme weather events.

Mexico has made significant commitments in mitigation actions. The Climate Change General Law (LGCC) establishes the objective of cutting down emmissions 30% by the year 2020 with respect to the baseline, and 50% by 2050 compared to those registered in 2000. These objectives are ambitious, but the benefits are multiple and, in many cases, represent gains for everyone involved. Generally, they imply actions to orient Mexico towards a cleaner and safer energy system, improvements to energy efficiency, and a more appropriate and sustainable use of natural resources with significant side benefits associated to health and the quality of life of persons. The energy reform may have a potential substantial effect on emissions in Mexico, so this opportunity demands the strengthening of climate policies. We must not miss this chance to shift to a lower-emission economy in which all sectors are jointly in charge of planning, implementing, and enforcing climate policies, as set forth in LGCC.

These actions, included in the PECC 2014-2018, must generate a lower cost to society, and therefore those projects and investments which generate benefits for the population must have the highest priority. This Strategy must also generate an inclusive sustainable development for Mexico which incorporates a transition to a low carbon emission economy, improves at the same time the economic competitiveness, and positions the country in the possibility of having a global climate agreement in 2015.

The PECC 2014-2018 establishes the contribution from the Federal Public Administration on mitigation matters to the year 2018 by means of steps supported by an allocated budget, an innovative element. These measures help in reaching the national mitigation objective by the year 2020. To meet these commitments made by Mexico, however, the actions included in the PECC 2014-2018 must be more ambitious, including those undertaken by the Federal Government, but also those carried out by the federal states, municipalities, and the social and private sectors (from large companies down to small and medium-sized companies). To this end, the Program is to be reviewed and improved every two years. In addition to these efforts, transparence, follow-up and accountability mechanisms should be designed for the actions established in the Program, so as to ensure the proper implementation thereof and the generation of the expected benefits.

The Council considers necessary the generation of processes, so that the committed mitigation and adaptation objectives are met. Achieving this will not be an easy task, particularly due to the challenges imposed by the energy policy transition. It will be important to carry out a number of measures parallel to the Program, such as developing the institutional capacity to implement some actions presented in the PECC 2014-2018, mainly at a municipal level; coordinating and having an effective participation among sectors and different parties, such as cities and rural areas; the availability of resources; and increasing awareness among the population.

In this administration Mexico has the responsibility of meeting its national objectives and get ready to the effects of climate change, acknowledging all scientific breakthroughs which point at the magnitude of this challenge. In this way not only the commitments made with the international community on climate change will be met, but we will also keep our natural capital, protect the population, and place Mexico as a model to the world.

This Council reaffirms its commitment to advise the CICC, the state and municipal governments and other sectors of the society to reach climate change mitigation and adaptation objectives.

Introduction

The Special Program on Climate Change2014-2018 (PECC, in Spanish) is one of the planning instruments of the Climate Change General Law (LGCC) and is aligned to the National Development Plan and related programs, as well as to the National Strategy for Climate Change (ENCC), 10-20-40 Vision (ENCC) and to the sector programs of the 14 Secretariats.

The following Secretariats took part in the development of the PECC 2014-2018: Environment and Natural Resources; Agriculture, Livestock, Rural Development, Fisheries and Food; Health; Communications and Transportation; Economy; Tourism; Social Development; State Department; Naval; Energy; Public Education; Treasury and Public Credit; Foreign Affairs; and Rural, Land, and Urban Development.

The PECC 2014-2018 has the objectiveof reducing the vulnerability of the populations and the productive sectors, as well as to preserve and protect ecosystems and environmental services, and increase resistance of the strategic infrastructure to the adverse impacts of climate change. It also represents the contribution of the Federal Public Administration for the 2014-2018 period to meet the objective set for 2020 of reducing by 30% the Greenhouse Gases (GHG) with respect to a trend scenario. To reach the objectives set by Mexico on climate change mitigation and adaptation, however, it is essential to have the contribution of all states and municipalities, the private sector, and the society at large.

The Program includes an assessment to present the current and future situation of Mexico on climate change issues. 5 objectives, 26 strategies and 199 lines of action derive from the Program, of which 77 lines of action correspond to climate change adaptation, 81 to mitigation, and 41 to the development of a government policy in these matters. Due to their relevance, some strategies and lines of action include an approach aligned to the National Program for the Equality of Opportunities and Non-Discrimination against Women (Proigualdad). These actions are aimed at reducing the gap between men and women, and addressing climate change impacts with a differentiated approach. The Program also includes an attachment with 31 actions supplementary to the lines of action and 10 result indicators to have a follow-up for the 2014-2018 period, with a baseline in 2013, a objective for 2018, and a methodology for its calculation.

The assessment section related to adaptation includes information on the impacts that the population, the ecosystems, productive sectors, and infrastructure are and would be exposed to as a result of climate change. It also presents data of the economic impact due to extreme hydrometeorological phenomena from 2009 to date, as well as the asymmetry in public expenditure between disaster prevention and attention during the 2005-2011 period. Likewise, the assessment identifies those municipalities with a higher vulnerability to climate change in Mexico.

The section of the problem assessment related to mitigation stresses the importance of controlling and reducing the emissions of Short-Lived Climate Pollutants (SLCP), also known as “Short-Lived Climate Forcers”, as these have a significant short-term impact on climate. Their reduction generates also side benefits to the health of the population and ecosystems.

The PECC 2014-2018 strategy of reducing, in addition to GHGs, and SLCPs is consistent with the provisions of the LGCC stating that all mitigation efforts shall begin with those actions with a higher potential to reduce emissions at the lower cost, and which result at the same time in environmental, social, and economic benefits. Likewise, this strategy agrees with the conclusions submitted in the 5th Assessment Report of the Climate Change Intergovernmental Panel, as well as with the guidelines of the Climate and Clean Air Coalition.

Most part of the lines of action contained in the PECC 2014-2018 have a budget allocated by the agency in charge of their enforcement. The integration of the budget programs supporting the lines of action constitutes the so-called "Attachment 15 on the Resources for Climate Change Adaptation and Mitigation" of the Federal Expenditure Budget (PEF, in Spanish).

The lines of action which do not have an allocated budget by agencies are those referred to the Nationally Appropriated Mitigation Actions (NAMA). They represent a chance for the private sector to take part in mitigation actions in a win/win situation. They are actions that promote eliminating barriers, and in some cases, they result in emission reduction certificates which may be exchanged in carbon markets.

The PECC 2014-2018 lists 13 lines of action to promote the undertaking of NAMAs subject to domestic or international financial and technological support, both public and private. The sectors proposed by these NAMAs include: Transportation, housing, industry, energy, maritime, education, residues, and agriculture activities.

Another objective of the PECC 2014-2018 is consolidating the National Climate Change System (SINACC, in Spanish) in which the Federal Government, the states, the association of municipalities, the Legislative Power, and society are involved. SINACC represents the institutional framework to call the status, and the social and private sectors to sign coordination and pact agreements to reach jointly the climate change national objectives and ensure the cross-cutting policies of public policies in these matters.

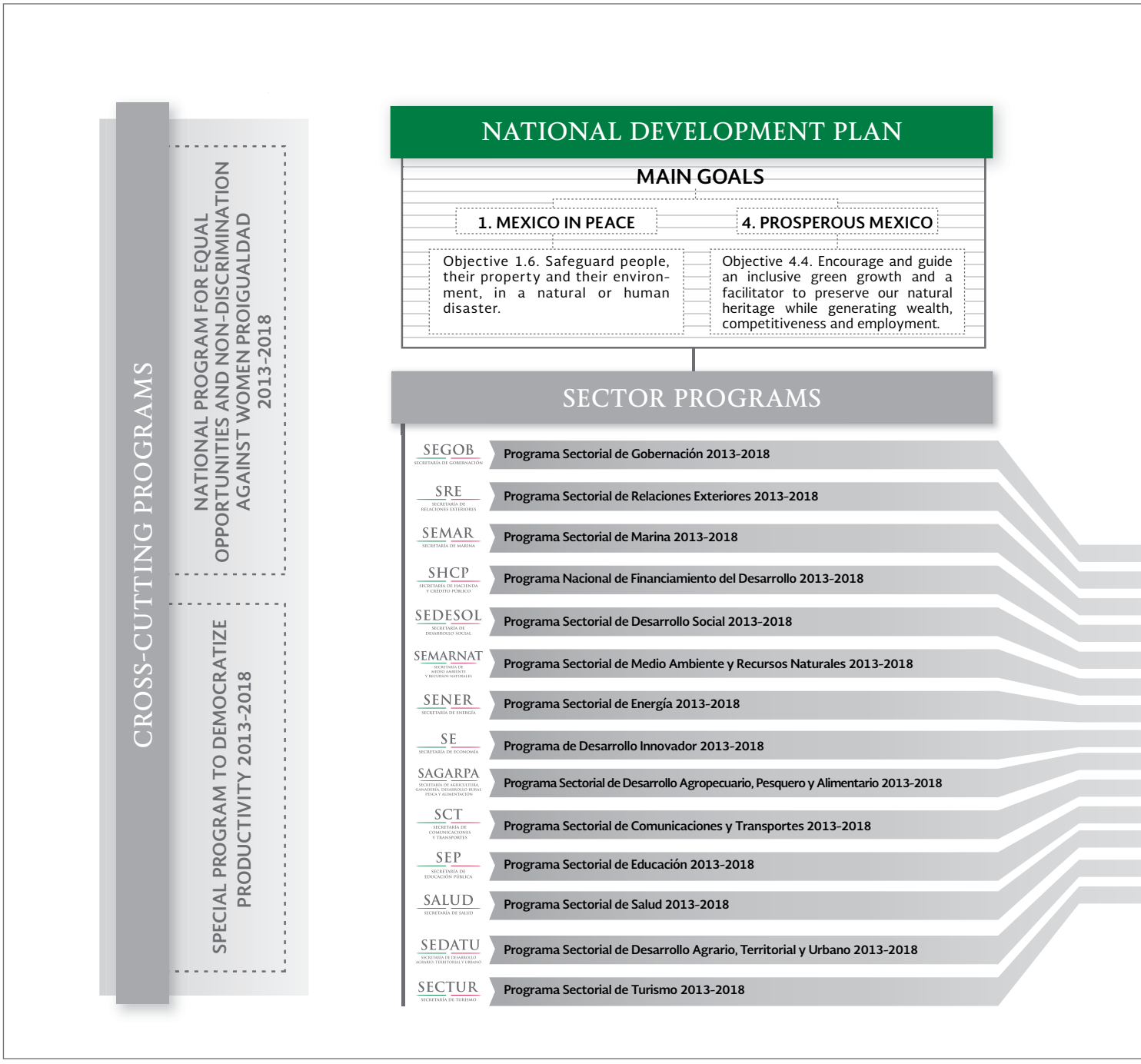
The instruments included in this Program which help in building the climate change domestic policies include: The National Risk Atlas which integrates gender indicators; the National Vulnerability Atlas; the National Emission Inventory; the National Emission Registry; the Mexican Official Norms; the Information System on Climate Change, as well as other financial, market, and economic instruments such as the tax on carbon, the voluntary emission trade system, and the Fund for Climate Change.

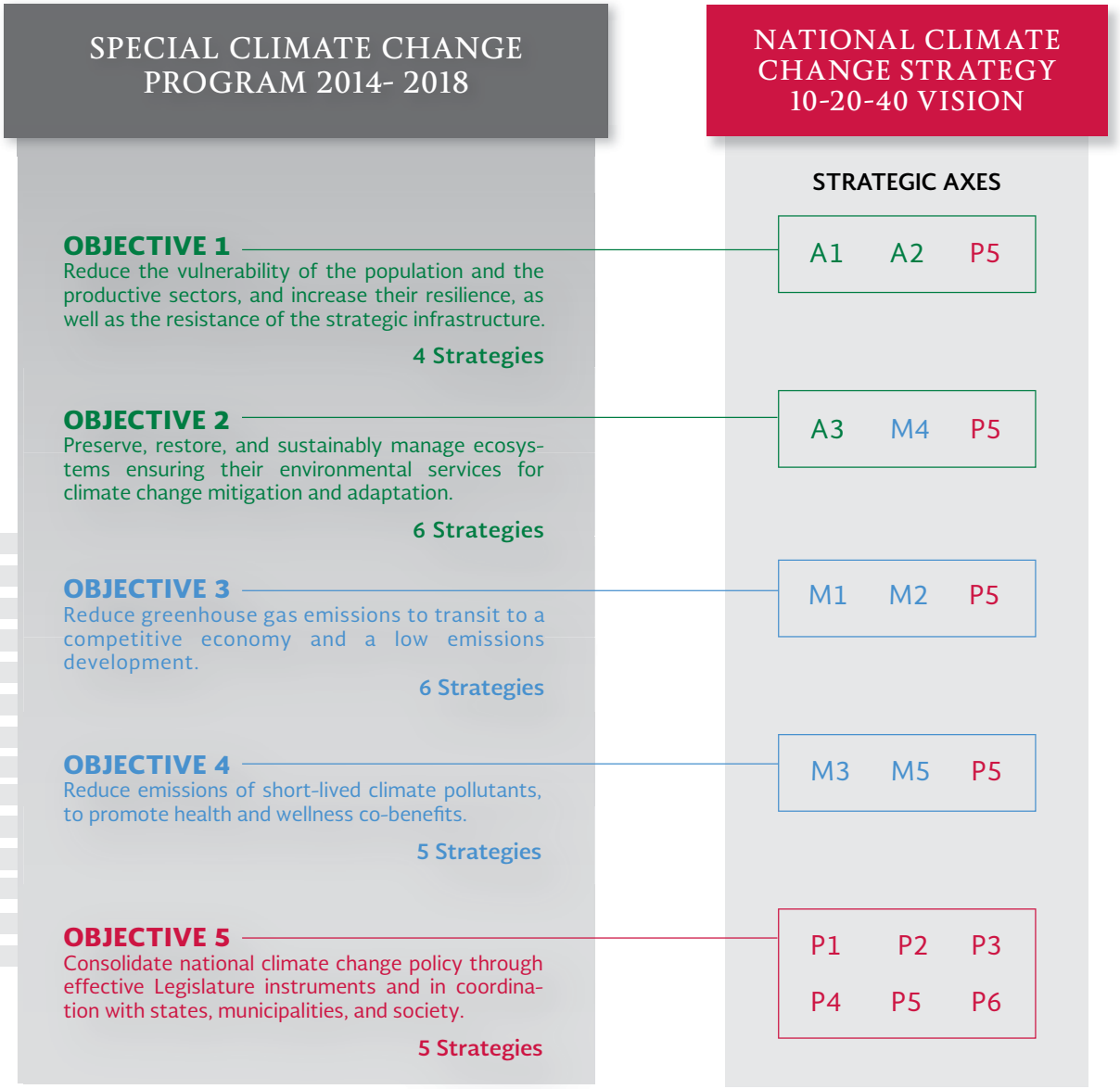
To monitor and report the PECC 2014-2018 each line of action includes technical data to have a follow-up. SEMARNAT has an on-line platform known as SIAT-PECC which allows the relevant agencies to report information on the progress of their lines of action. SEMARNAT will report on an annual basis the progress estimation for the PECC 2014-2018 to be published during the first two-month period of each year on http://www.semarnat.gob.mx

This Program will be reviewed, assessed and, if applicable, adjusted or modified under Section 98 of the LGCC which establishes that climate change domestic policies shall be subject to a regular and systematic assessment by INECC's Assessment Coordination, and under Section 104 which sets forth that such assessments shall be conducted every two years.

Alignment of the PECC 2014-2018 to domestic objectives

The next figures shows the alignment of the PECC 2014-2018 to the objectives contained in the *National Development Plan*, the Federal Government Transverse Programs, the Sector Programs of the Government Secretariats of the Inter-secretarial Commission on Climate Change (CICC), and the *Climate Change National Strategy Vision 10-20-40* (ENCC).




SPECIAL CLIMATE CHANGE PROGRAM 2014- 2018
NATIONAL CLIMATE CHANGE STRATEGY 10-20-40 VISION
STRATEGIC AXES
OBJECTIVE 1
Reduce the vulnerability of the population and the productive sectors, and increase their resilience, as well as the resistance of the strategic infrastructure.
4 Strategies
A1 A2 P5
OBJECTIVE 2
Preserve, restore, and sustainably manage ecosystems ensuring their environmental services for climate change mitigation and adaptation.
6 Strategies
A3 M4 P5
OBJECTIVE 3
Reduce greenhouse gas emissions to transit to a competitive economy and a low emissions development.
6 Strategies
M1 M2 P5
OBJECTIVE 4
Reduce emissions of short-lived climate pollutants, to promote health and wellness co-benefits.
5 Strategies
M3 M5 P5
OBJECTIVE 5
Consolidate national climate change policy through effective Legislature instruments and in coordination with states, municipalities, and society.
5 Strategies
P1 P2 P3
P4 P5 P6

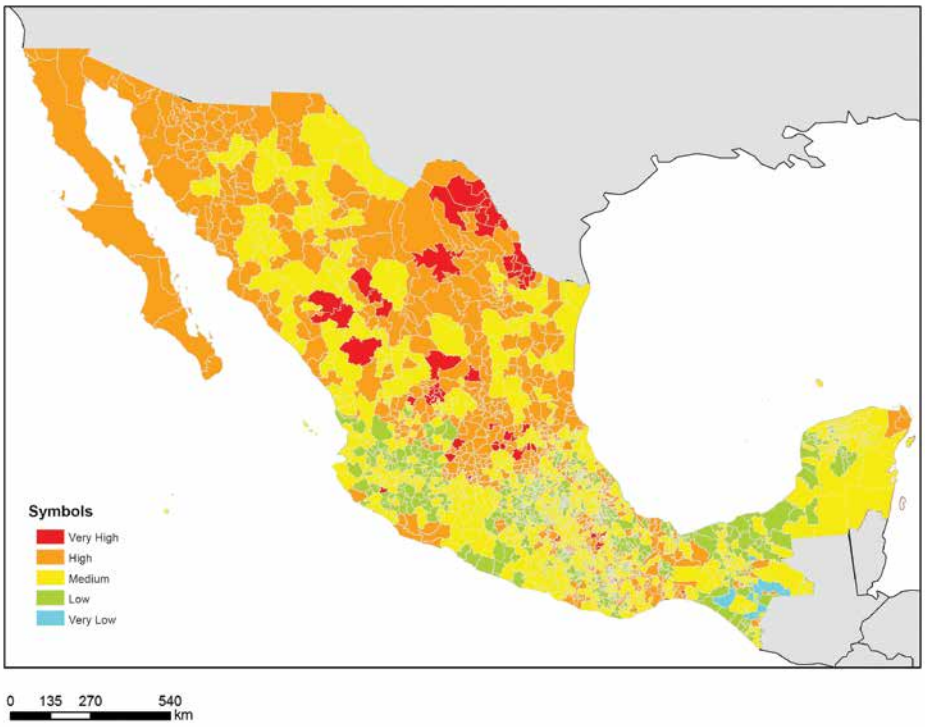
Mexico and the climate change risks

Mexico has geographical characteristics that makes it one of the most vulnerable countries in the world to climate change. Its location between two oceans, and its latitude and topography expose the country to a number of hydrometeorological phenomena.[1]

The Disaster Prevention National Center (Cenapred, in Spanish) and the National Meteorological System (SMN) have made research on the danger conditions for Mexico, as shown in the following maps.

Map 1 shows at a municipal level, the rain deficit and the average duration of such deficit for the available periods of data from climate stations to 1999. Worth noting is that drought impacts are differentiated by region, since in some areas a minimum rain deficit can have high environmental, social, and economic impacts.

Map 1. Degree of danger due to droughts

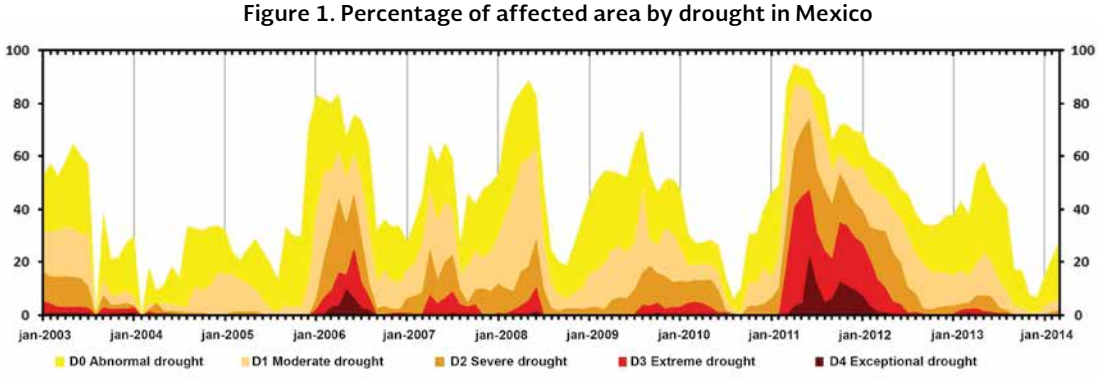


Source: Cenapred, 2014

[1] The impacts due to high-intensity hurricanes have increased over the last decades (Inter-Secretarial Commission on Climate Change). 2012. *Climate change adaptation in Mexico: Vision, Elements, and Criteria for Decision Making.* Semarnat, INECC. 186 pp.). An analysis of the changes in the frequency of hurricanes impacting the Mexican territory from 1970 to 2009 reveals an increase in their number, particularly those with high intensity (Categories 3, 4, and 5) in the Gulf of Mexico and the Caribbean. During this period the Mexican Atlantic areas have been hit by 264 tropical hurricanes, while the Pacific zones have seen 549.

Figure 1 shows the evolution and percentage of Mexico's area impacted by one or several drought categories between the years 2003 and 2013.

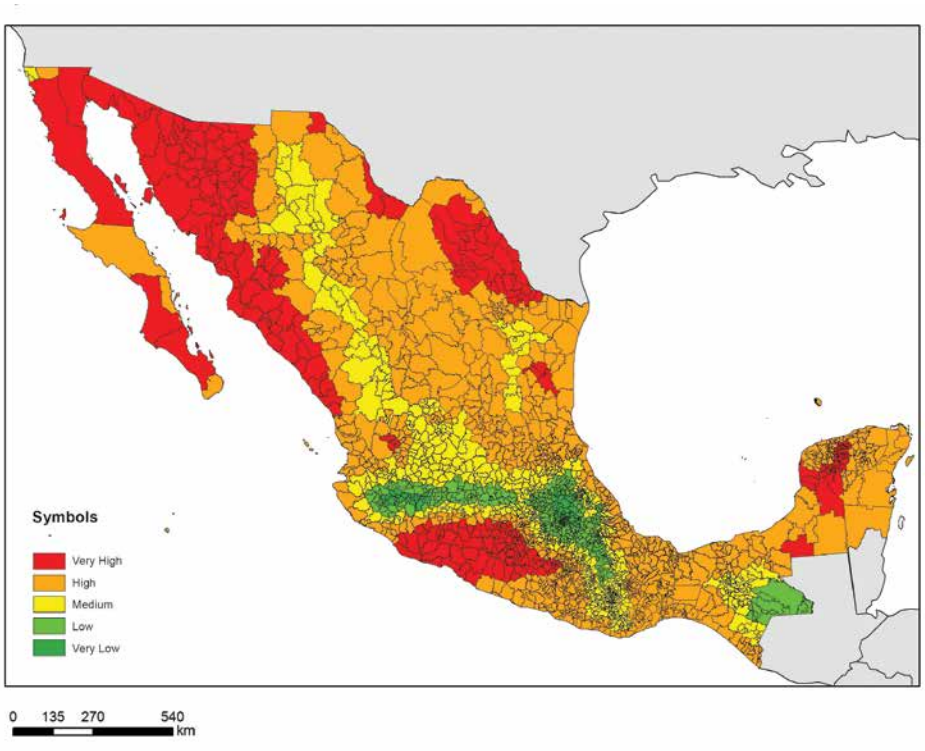
Figure 1. Percentage of affected area by drought in Mexico



Source: SMN-Conagua, 2014

Map 2 considers data on the maximum daily temperatures recorded in 340 climate stations with data of at least 30 years or more. The danger analysis was calculated based on percentile 90 of each series of data. Results show that the more vulnerable areas (with a very-high danger rate) to heat waves are: The Pacific coast plains, mainly the municipalities which are part of the Balsas river basin; northeast Coahuila; northern Nuevo León; as well as a large area of Baja California peninsula and the central area of the Yucatan peninsula.

Map 2. Danger rate due to heat waves



Source: Cenapred, 2014

Map 3 presents the spatial distribution of areas vulnerable to floods in Mexico. This map was developed considering topographic, geomorphological, geological, pedological, drought density, plant extension, and precipitation criteria.

Map 3. Spatial distribution of areas susceptible to floods

Source: INECC, 2014

Increase of temperatures in Mexico over the last 50 years

It is estimated that the hydrometeorological phenomena shown in the maps above might be more recurring and increase their intensity due to the impacts of climate change.[2] For example, extreme temperatures will have a decline in their 2 to 1.5 year return period in Mexico and Central America between 2046-2065 and 2080-2100 horizons; this is also the case for extreme precipitation events where a 15 to 12 return period reduction will be seen for the same horizons. Mexico has become warmer since the 1960s.[3]

The average temperatures have increased 0.85°C, a figure which corresponds to the global increase reported by the Intergovernmental Panel on Climate Change (IPCC), while winter temperatures have increased 1.3°C. The number of cooler days have also declined, and warm nights have increased. Rain falls have decreased in southeast Mexico in the last 50 years. Temperatures have risen by region, with the northern areas showing the highest increase, 0.25°C to 0.50°C per decade,[4] between 1960 and 2010.[5]

[2] There is no general agreement on the increase of hurricanes. Research, however, is still underway to have more certainty if there are actually a higher number of hurricanes.

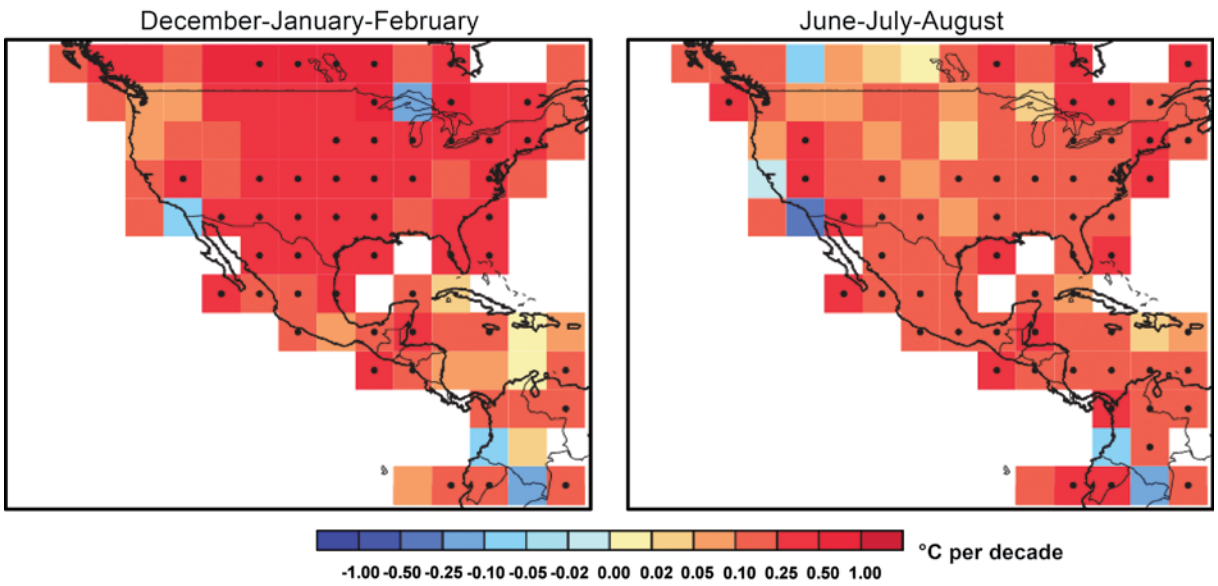
[3] Source: Met Office Great Britain and INECC data.

[4] Average of temperature anomalies from December to February.

[5] Source: Met Office Great Britain, page 14.

Map 4 shows the average warming from 1960 to 2010; grids with a point represent those areas where data is more reliable.

Map 4. Average warming between 1960 and 2010



Source: UK Met Office. INECC. 2013. Climate: observations, projections and impacts. Summary factsheet Mexico. http://www.metoffice.gov.uk/climatechange/policy-relevant/obs-projections-impacts

Note: The resolution of these maps is 5° Latitude, 5° Longitude

Climate change scenarios in Mexico

Several models that project possible changes in temperature and rainfall have been developed and perfected in the last decade. The most recent for Mexico were developed based on the best available information using the results of 15 climate models[6] weighting their performance according to its ability to reproduce the conditions observed in Mexico and their convergence in the values projected to the future.

Worth noting is that climate change scenarios are not forecasts, but the result of climate models which simulate future conditions given a change in the concentration of GHGs, projected under different economic and social conditions worldwide. These scenarios are divided in four groups[7] which refer to radiative forcing[8] expressed in W/m^2.

Another element to consider is the time horizon over which scenarios are projected. Considering changes in the average temperature and rainfall between 1961 and 1990, for the 2030 decade (2015-2039 average), the projected changes are not abrupt, but to the extent projections are farther from the present, changes will be more evident (i.e. by 2100).

As regards rainfall, different models show different projections, although in average for Mexico, it is estimated that precipitations will decline to 10% in most areas of Mexico, but there will be regions where such decline could be higher.

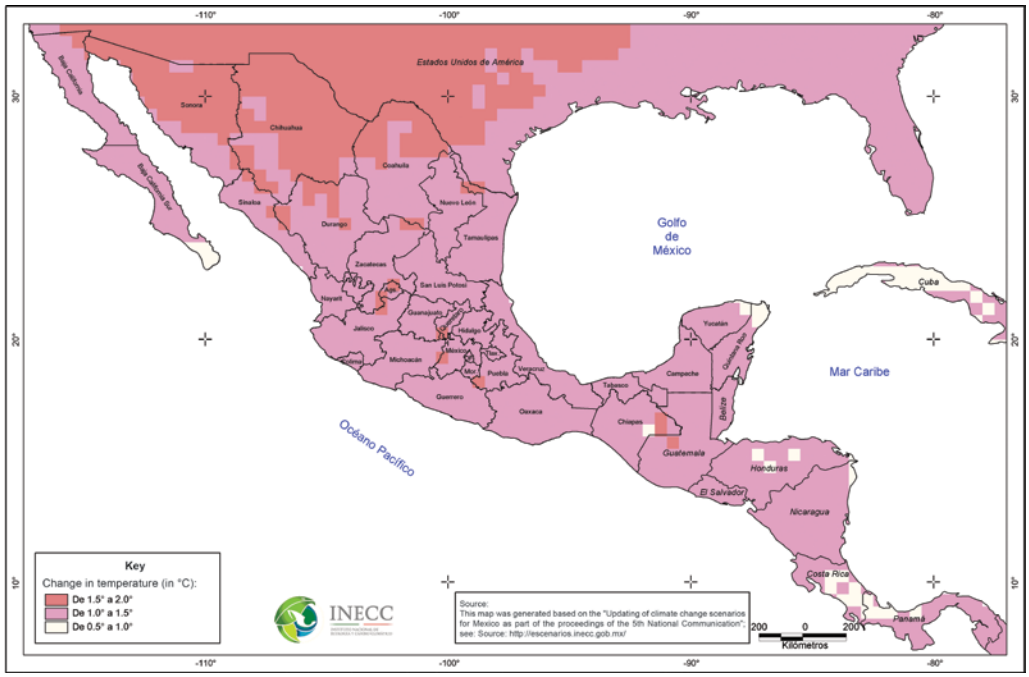
[6] Cavazos, T., J. A. Salinas, B. Martínez, P. de Grau, R. Prieto, C. Conde, A. Quintanar, J. Santana, R. Romero, M. E. Maya, J. G. Rosario, M. R. Ayala, H. Carrillo, O. Santiesteban, M.E. Bravo, 2013, *Actualización de escenarios de cambio climático para México como parte de los productores de la Quinta Comunicación Nacional*, escenarios.inecc.gob.mx

[7] RCP2.6, RCP4.5, RCP6.0, and RCP8.5. Representative Concentration Pathways (RCP).

[8] Radiative forcing is the change in the net vertical irradiation expressed in W/m^2 in the tropopause due to an internal change or to a change in the external forcing of the climate system (i.e., a variation in the concentration of carbon dioxide or the power of the sun). IPCC, 2001.

As it may be seen in Map 5, northern Mexico could show a 2°C increase in temperature, while in most areas of the country changes are projected within a range of 1°C - 1.5°C, except for some areas in the peninsular zones where changes could be lower to a maximum increase of 1°C.

Map 5. Changes in the average of the annual temperature for the future (2015-2039)



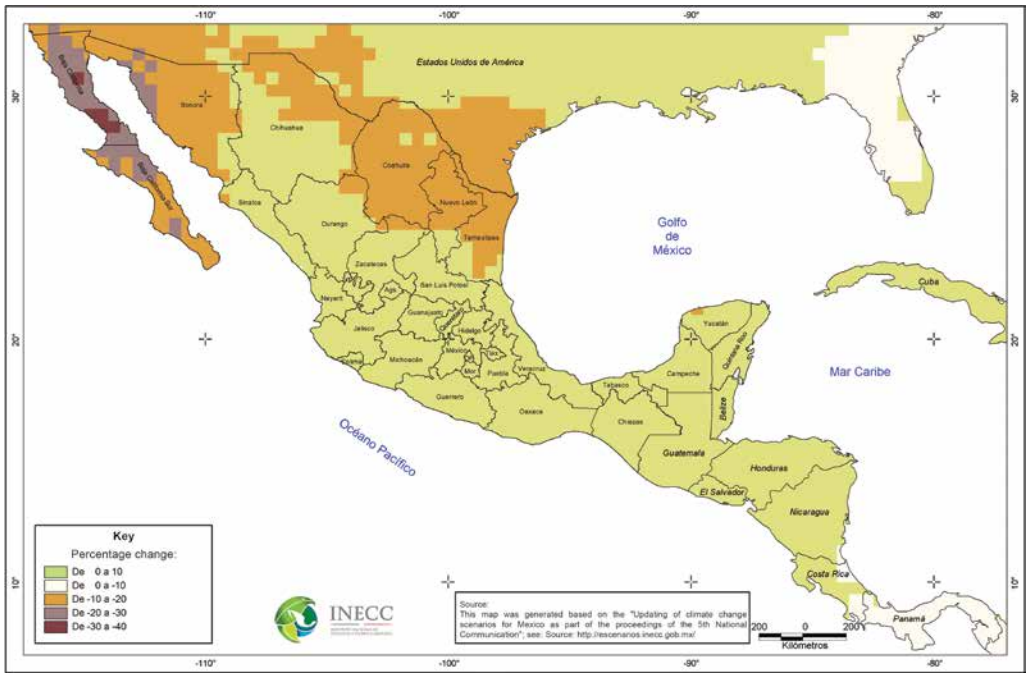
Source: http://escenarios.inecc.gob.mx/
Note: The resolution in this and the following maps is 0.5° Latitude x 0.5° Longitude.

Wildfire. Source: Semarnat, 2012

El Pinacate. Source: Conanp, 2012

At it may be seen in Map 6, there is a downward trend in Mexico's annual rainfall within a range of 10 and 20%. Worth noting is that the State of Baja California would show the highest decline in annual precipitation to 40%.

Map 6. Changes in the average of the annual precipitation for the future (2015-2039)



Source: http://escenarios.inecc.gob.mx/

Drought. Source: Semarnat, 2013

In addition to the projections above, a number of vulnerability assessment for several climate change scenarios have been developed in Mexico during the last two decades, and have been perfected during this time. There is evidence showing that the effects of climate change together with other pressure factors will have very negative ecological, economic, and social consequences which are already apparent.[9]

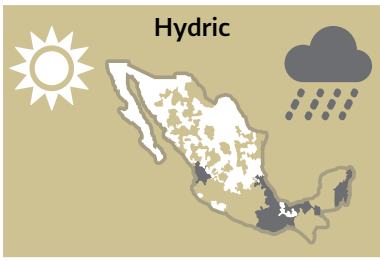
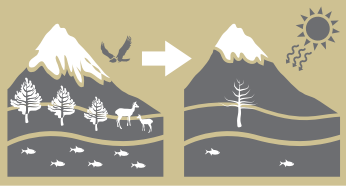
Table 1, Impacts of Climate Change in Priority Sectors for Mexico,[10] shows a summary of the result of the research done on this subject.

[9] Sarukhán, J. *et al.*, 2012. *Capital Natural de México: Acciones estratégicas para su valoración, preservación y recuperación*. National Commission for Knowledge and Use of Biodiversity, Mexico. 91 pp.

[10] Based on: UK Met Office. INECC. 2013. *Climate: observations, projections and impacts. Summary factsheet* Mexico. http://www.metoffice.gov.uk/climatechange/policy-relevant/obs-projections-impacts

Table 1. Impacts of Climate Change on Priority Sectors for Mexico

Scenario: Rise in temperatures between +2.5°C - 4.5°C; and lower precipitation between -5 and 10%[11]

Systems and Sectors	Projected Impacts	Level of Trust
Agriculture 	Reduction in corn productivity for the decade of 2050, which adds to the current problem that 25% of production units show a soil fertility loss. There is some evidence that most crops will be less adequate for production in Mexico by 2030, and by the end of this century this situation could be worse.	•
Hydric 	Most areas of Mexico will become drier and droughts will be more frequent with the resulting higher demand of water, particularly in the northern and urban areas.	• •
	On the other hand, there will be areas where rainfall could be more intense and frequent, thus increasing the risk of floods for nearly 2 million people currently living in a medium to high vulnerability situation, as well as for people dwelling in places with less than 5,000 inhabitants located mainly in the lower areas of basins, added to the risk of landslides due to heavy rains.	• • •
Coastline 	The rise in sea levels represents a danger for residential and infrastructure areas located along the coastline. Moreover, the water and agricultural sectors could be affected by the effects of saline intrusion.	• •
Storms and heavy weather 	There is a consensus on the intensity of cyclones in the Northwest Pacific and North Atlantic areas. The uncertainty around these changes and their intensity, however, makes difficult to estimate their impacts on Mexico; it is foreseen that given a higher number and intensity of storms, impacts could have significant social and economic adverse consequences.	• •
Ecosystems and Biodiversity 	As regards land ecosystems, one example is the potential reduction of the area covered by conifer woods, species in arid and semi-arid areas, and forest species in temperate areas. In the case of oceans, a rise in temperatures could result in the demographic collapse of marine populations, thus causing a low productivity for fisheries. For land and flying mammals, it is estimated that by 2050 there will be a reduction of nearly half of the species under research, loosing over 80% of their historical distribution range.	• •
Strategic Infrastructure 	It is essential to enhance the research conducted about the climate change impacts on the tourist, port, energy, communications, and transportation infrastructure, which may be affected by the rise in the number and intensity of tropical cyclons and stronger storm tides. .	

Symbols by degree of impact. It is a subjective measure based on an expert opinion that considers the magnitude of the projected impact, the vulnerability and the ability to tackle it. We do not have enough date to assess the level of impact on the strategic infrastructure.

Level 1: Low Impact

Level 2: Medium Impact

Level 3: High Impact

Level of Trust. This item was given a rate of one to five points, 5 being the highest realiability of information. It is also a subjective measure based on the opinion of experts. It is considered that the most recent arbitrated research has a higher level of trust. The factors considered are the concordance among climate models, the quality of data and information used for the research, as well as the agreement among the available solid studies for this area.

[11] Projected changes refer to the average of temperatures and precipitation from 1961 to 1990.

As it may be seen in this assesment, vulnerability not only depends on adverse climate conditions, but also on the capabilities of society to anticipate, face, resist, and recover from an impact. Thus, the vulnerability of a society is determined by its exposure to climate events, its response capacity, and its institutional and social capacities.

Social vulnerability

A determining factor for social vulnerability in Mexico is poverty. It is estimated that 68% of the population has been affected once by disasters, a figure that corresponds to extreme poverty and low-income groups in Mexico. These groups live in precarious housing and high-risk areas in the event of climate disasters, such as mountain slopes, ravines, or areas susceptible to floods.[12]

In addition to this, the agricultural sector is closely related to the daily activities of the Mexican population. Besides being a substantial source of income, this sector is vital to feed people. It is one of the most vulnerable and, at the same time, one that has a greater impact on Mexico's ecological wellbeing. Increases in temperature, as well as changes in extreme temperatures and rainfalls may result in severe reductions in the productivity of the agricultural sector.[13]

As regards urban areas, it is very likely that climate conditions will be significantly different. Therefore, it is important to include climate change criteria in the design and construction of housing, as well as in hospitals, power generating facilities, communications and transportation, tourist infrastructure, and to management instruments.

With respect to the economic impacts caused by extreme weather phenomena, the National Strategy on Climate Change Visión 10-20-40 (ENCC) establishes that the average annual costs have gone from $730 million pesos between 1980 and 1999, to a $2.19 billion in 2000-2012.[14] These impacts are associated to the increase in such extreme phenomena, as well as to a greater degree of exposure of the population, the infraestructure and productive activities in Mexico.

Community "El Gato", Guanajuato. Author: Jorge Rebollar, 2013

Highway Amecameca-Cuautla. Source: Presidency of The Republic, 2014

[12] Saavedra, F. 2010. "Vulnerabilidad de la población frente a inundaciones e inestabilidad de laderas", in: H. Cotler (coord.), *Las cuencas hidrográficas de México: Diagnóstico y priorización*. National Institute of Ecology, Semarnat-Fundación Gonzalo Río Arronte I.A.P, Mexico.

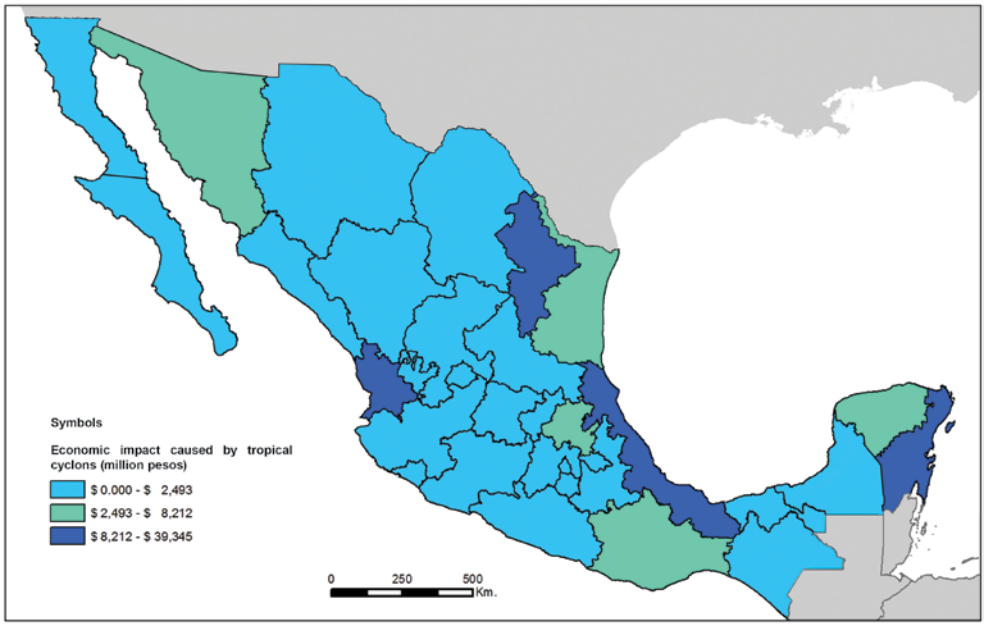
[13] Agricultural land as a strategic factor of production amounts to about 26 million hectares. Of which, 26% are irrigated and 74% are cultivated temporarily, which are much more vulnerable and dependent on weather conditions. The irrigated area has barely grown over the past forty years and infrastructure deterioration has caused serious deficiencies in its use. However, 60% of the production value is produced in the irrigation lands, whereas temporal lands are increasingly exposed to the effects of climate change (droughts, floods, frost, etc.), which represents a structural obstacle to productivity and an impediment to the development of free and healthy societies.

[14] Federal Government of Mexico, *National Climate Change Strategy: 10-20-40 Vision*, 64pp. http://www.encc.gob.mx/en/index.html

One example of the economic impact at a state level due to rains, tropical cyclons and floods from 2000 to 2012 is shown in the following maps. These maps are based on: *Socioeconomic Impact of Disasters on Mexico*, developed by Cenapred and which considers the following variables: damages and losses in public infraestructure (housing, schools, hospitals, culture, water, highways) and public works, agriculture, livestock, fisheries, trade, services, industry, tourism, and other sectors, such as environment, emergencies, and health-promotion campaigns.

As seen in map 7, the states with higher economic losses within a $ 8,212 to $ 39,345 million peso range were: Nuevo León, Veracruz, Nayarit and Quintana Roo, followed by Sonora, Tamaulipas, Oaxaca, Yucatán, and Hidalgo with a range of $ 2,493 to $ 8,212 million pesos. The other states of Mexico had economic losses which did not exceed $ 2,493 million pesos.

Map 7. Economic impact caused by tropical cyclons (2000-2012)

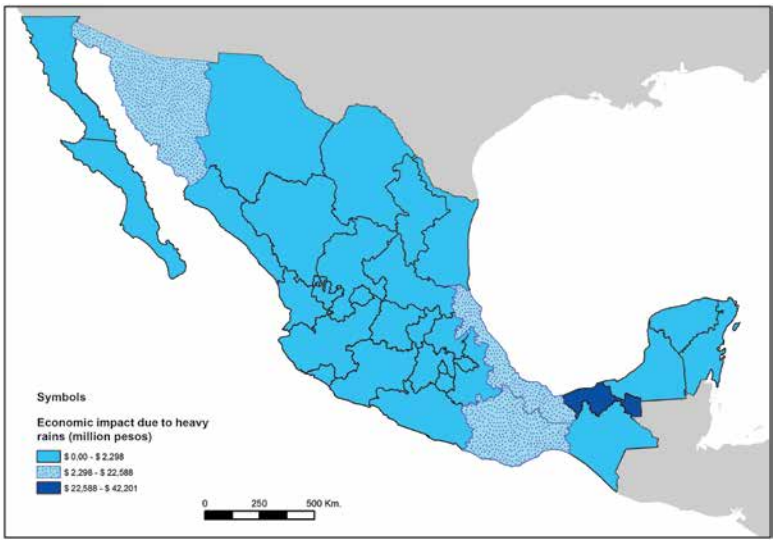


Source: Cenapred, 2014

Landslide on road Xalapa-Coatepec. Source: State of Xalapa, 2014

Map 8 shows that the state of Tabasco had higher economic losses due to rains with a range of $ 22,588 to $ 42,201 million pesos. The states of Veracruz, Oaxaca, and Sonora were second place with losses of $ 2,298 to $ 22,588 million pesos; while the rest of the states had losses which did not exceed $ 2,298 million pesos.

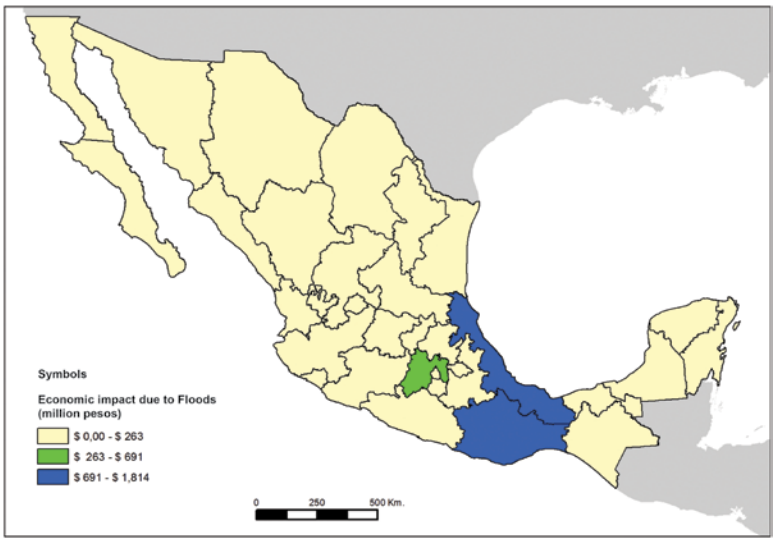
Map 8. Economic impact due to heavy rains (2000-2012)



Source: Cenapred, 2014

Map 9 identifies that Veracruz and Oaxaca showed greater economic losses resulting from floods, with a range of $ 691 to $ 1,814 million pesos. The second place was for the State of Mexico with losses between $ 263 to $ 691 million pesos. In the rest of the states of Mexico losses did not exceed $ 263 million pesos.

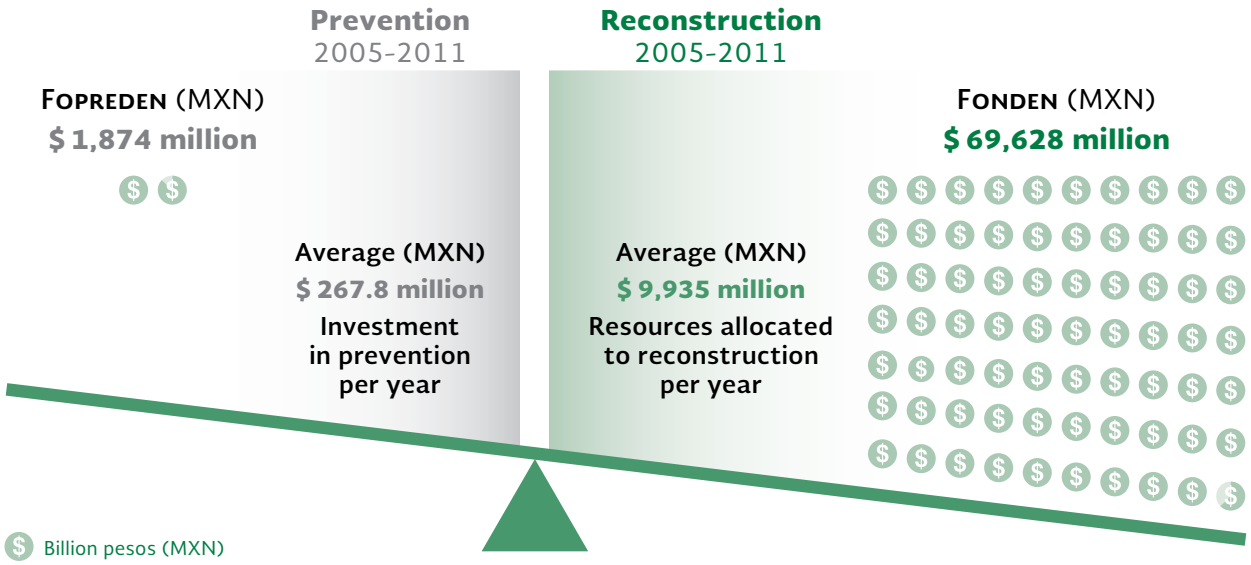
Map 9. Economic impact due to floods (2000-2012)



Source: Cenapred, 2014

Given the vulnerability described above it is imperative to strengthen risk management in Mexico. The country has been characterized until now for having a reactive stance, more than a preventive one to disasters. An example of this is the federal budget allocated to the National Natural Disaster Fund (Fonden) and the Natural Disasters Prevention Fund (Fopreden) shown in the figure below.

Figure 2. Comparison of federal budget allocated to Fonden and to Fopreden [15]



Source: OCDE, 2013

Given the greater recurrence of extreme weather phenomena and their impact on the social sector, as well as the scarce budget earmarked to disaster prevention, we must reinforce our expertise on the dangers and threats to which we are exposed and give priority to prevention to address disasters.

Likewise, it is crucial to continue promoting research on the vulnerability and adaptation to climate change in Mexico, as it is an instrumental tool to a well-informed decision-making. An example of this is the research conducted by the National Institute of Ecology and Climate Change (INECC) on those municipalities most vulnerable to climate change. This research considered in its first stage 3 studies[16] and took as reference another two.[17] As a result of this analysis 480 municipalities of Mexico were identified with "very high" or "high" vulnerability.

Floods in the state of Tabasco. Source: Semarnat, 2012

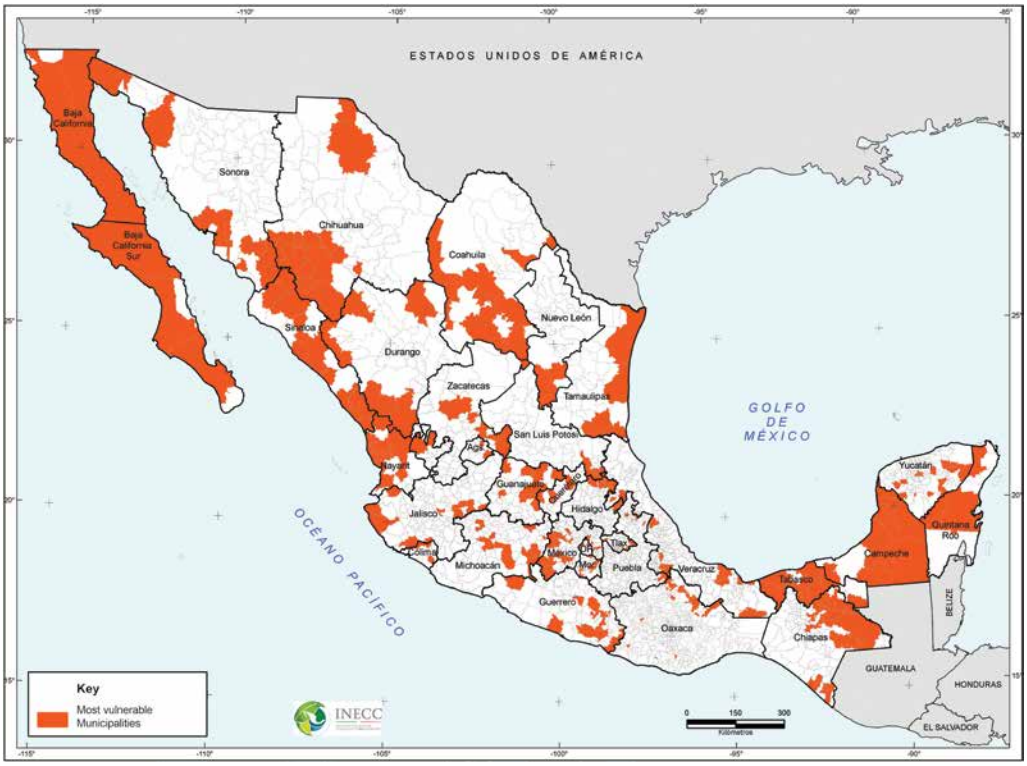
[15] Between 2005 and 2011, Fonden average annual expenditure rose to $ 742 million, whereas that Fopreden expended an annual average of $20 million (OECD, 2013). The figure shows data in Mexican pesos using the exchange rate to 4 February, 2014: 13.39 pesos (MXN) per dollar. Source: Central Bank of Mexico (Banxico).

[16] 1) *National Climate Change Strategy: 10-20-40 Vision*; 2) *Estudio de vulnerabilidad y adaptación a los efectos del cambio climático en México*, Gay 2013; and 3) Monterroso, 2013, *Two methods to assess vulnerability to climate change in the Mexican agricultural sector.*

[17] 1) "Mapa de Vulnerabilidad Hídrica" en *México ante el Cambio Climático* (Martínez, 2010); 2) hydro-meteorological hazards risk index maps at local scale, (Cenapred, 2013); and 3) Borja and de la Fuente report, 2013, about *Municipal Vulnerability to Climate Change and Climate-Related Events in Mexico.*

In a second stage, and taking the 480 selected municipalities as a baseline, the most vulnerable municipalities by state were identified. This analysis resulted in a list of 319 municipalities (a total of 13% of Mexico) shown in Map 10. Likewise, the total strategic infrastructure was identified, such as hospitals, schools, and highways located in these municipalities (Figure 3).

Map 10. Most vulnerable municipalities to climate change impacts



Source: INECC, 2014

Figure 3. Total of strategic infrastructure located in the municipalities most vulnerable to climate change

Health
Medical Units:
494

Education
Campuses:
5,984

Communications
Highways:
26,288.5 km

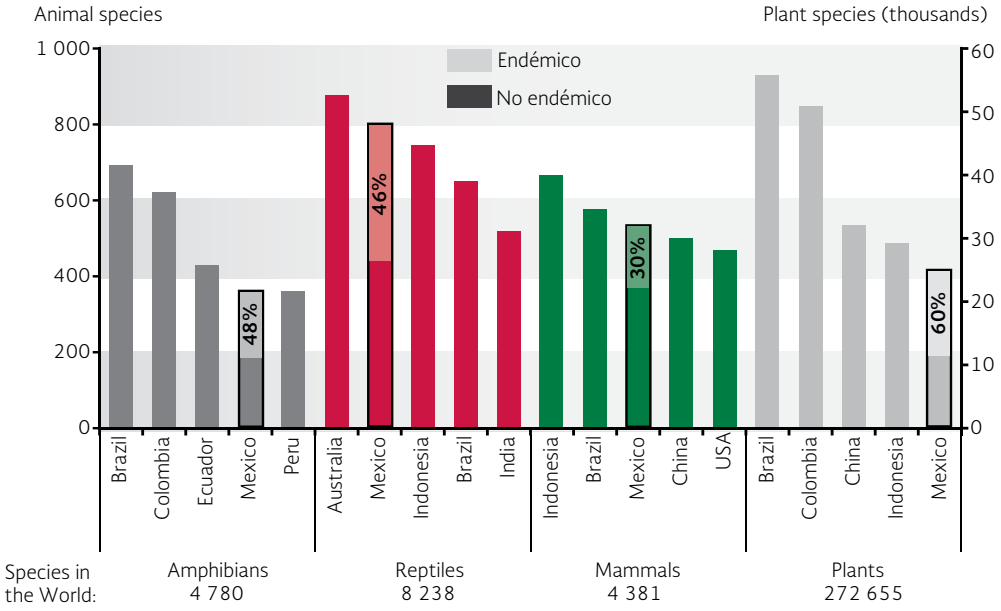
Source: DGPCC, with date from INECC, 2014

This study will be kept updated and enriched with the information provided by the states and municipalities from their climate change programs, and their state and municipal risk atlases.

Vulnerability of natural capital and environmental services

Mexico occupies 1.7% of the planet's land surface and has 10% of its known biodiversity (see Figure 4). Its ecosystems provide essential environmental services for life, such as carbon sequestration, water supply and preservation, the preservation of the habitat for species, the reduction of weather disaster impacts, as well as soil formation and preservation.

Figure 4. Countries with the greatest diversity of animals and plants



Sources: For Mexico: Semarnat, Conabio, Mexico, 2012. Other countries: World Resources Institute, 2004.

Mexico has lost 127 species, 74 of which were endemic.[18] In 2002 the natural vegetation coverage represented only 50% of the original surface.[19] Between 1976 and 2009 the basins of the Gulf of Mexico showed the highest losses in primary vegetation[20] and in 2002, a study estimated that 45% of the surface of soils in Mexico had some type of degradation.[21]

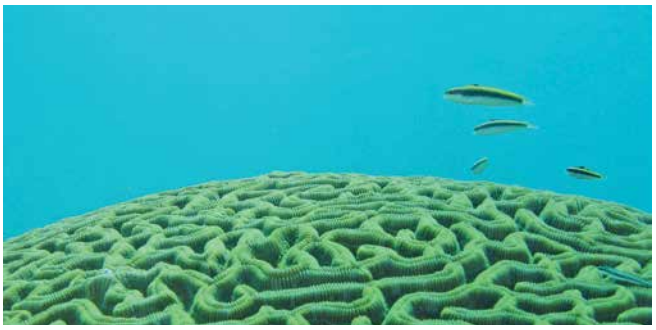
Pénjamo, Guanajuato. Author: Miguel Ángel Ayala Mata, 2014

[18] Conabio, 2009, Capital Nacional de México, Synthesis.
[19] Challenger *et al.* 2009.
[20] Cuevas *et al.* 2010.
[21] Semarnat and El Colegio de Posgraduados, 2003, Assessment of Man-Induced Soil Erosion in Mexico, 1:250 000 scale, Memoria Nacional 2001- 2002.

Here are some of the projected impacts on biodiversity resulting from climate change:

- Mexico could lose in the next 30 years a high percentage of conifer and red oak woods, as well as a large portion of vegetation in the deserts.[22]
- It is estimated that by 2050 at least 15 land mammals will have a 50% reduction in their distribution range; of these, 9 endemic species could lose 80% of their historical distribution range and at least 13 would double or more their distribution area. [23]
- The rise in temperatures has contributed to the introduction and establishment of exotic invading species which displace native species more vulnerable to the new climate conditions.[24]
- The increase in CO_2 reduces the calcification and growth of coral reefs by up to 40%.[25]
- Estuary species could be affected by changes in inland spills, as well as due to higher sea levels.[26]
- Sea level rises could vary their intensity, and in such case fishing associations (sardine, anchovies and squid) could be geographically displaced.[27,28,29]
- Environmental services would be affected in the alteration of phenological patterns, a reduction and higher variability of food production, and a lower availability and poor quality of water, to mention just a few.[30]

Tropical Forest. Source Semarnat, 2014



Coral reef. Source: Semarnat, 2014

Iguana. Source: Semarnat, 2014

Coatepec, Veracruz. Author: Gloria Cuevas Guillaumin, 2013

[22] Gómez Díaz, J.D., Monterroso Rivas A.I., Tinoco Rueda J.A., *et al.*, 2011, *Assessing current and potential patterns of 16 forest species driven by climate change scenarios in Mexico*, Atmosphere, 24(1):31-52.

[23] Trejo, I., Martínez-Meyer E., Calixto-Pérez E., *et al.*, 2011, *Analysis of the effects of climate change on plant communities and mammals in México*, Atmosphere, 24(1):1-14.

[24] Conabio, 2010, National Advisory Committee on Invasive Species, 2010. *National strategy on invasive species in Mexico, prevention, control and eradication*. National Commission for Knowledge and Use of Biodiversity, National Commission of Natural Protected Areas, Secretariat of Environment and Natural Resources (Semarnat), Mexico

[25] Hoegh-Guldberg O, P.J Mumby, A.J. Hooten, R.S. Steneck, P. Greenfield, E. Gomez, C.D. Harvell, P.F. Sale, A.J. Edwards, K. Caldeira, Knowlton, C.M. Eakin, R. Iglesias-Prieto, N. Muthiga, R. H. Bradbury, A. Dubi, M.E. Hatziolos, 2007, *Coral reefs under rapid climate change and ocean acidification*, Science, 318: 1737-1742.

[26] Martínez-Arroyo, A. Manzanilla Naim S., Zavala Hidalgo J., 2011, *Vulnerability to climate change of marine coastal fisheries in Mexico*, Atmósfera, 24(1):103-123.

[27] Aburto-Oropeza, O., Ezcurra E., Daneman G., *et al.*, 2008, *Mangroves in the Gulf of California increase fishery yields*, 105(30): 10456 -10459.

[28] Ezcurra, E., 2009, *Impacto climático en los ecosistemas marinos,* in: *México ante el Cambio Climático,* Greenpeace. http://www.greenpeace.org/mexico/Global/mexico/report/2010/6/vulnerabilidad-mexico.pdf

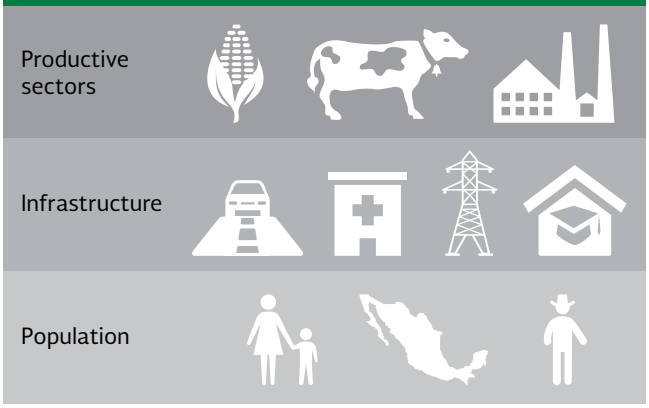
[29] Caso, M., González-Abraham C., Ezcurra E. 2007, *Divergent ecological effects of oceanographic anomalies on terrestrial ecosystems of the Mexican Pacific coast*, Proceedings of the National Academy of Sciences of the United States of America, 104 (25):10530-10535 pp.

[30] INECC, 2012.

In view of the vulnerability described here, the PECC 2014-2018 proposes two objectives:

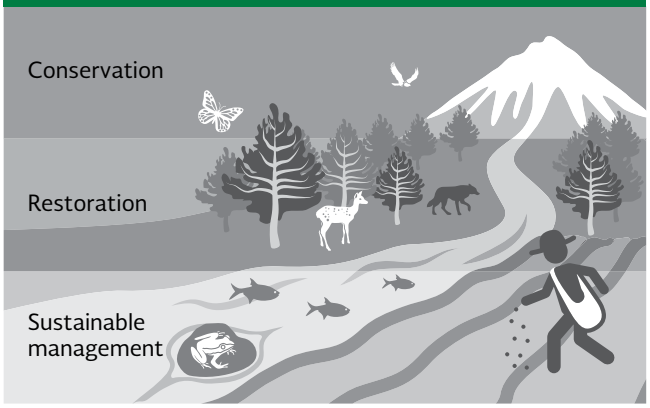
OBJECTIVE 1

Reduce the vulnerability of the population and the productive sectors, and increase their resilience, as well as the resistance of the strategic infrastructure



OBJECTIVE 2

Preserve, restore, and manage ecosystems in a sustainable manner ensuring their environmental services for climate change mitigation and adaptation



These objectives promote both the strengthening of institutional and population capacities, and the design, prioritization and implementation of actions to reduce the vulnerability of systems (i.e. environmental, social and economic).

Moreover, these objectives seek to give a priority to prevention acknowledging that it has a lower cost in comparison to disaster attention. The PECC 2014-2018 seeks the cross-cutting character and the integration of actions to consolidate climate change adaptation in Mexico.

National Park Bahia de Loreto, Baja California. Author: Fernando Camacho, 2014

Objective 1. Reduce the population and productive sectors vulnerability, and increase their resilience, as well as the resistance of the strategic infrastructure

This objective focuses the actions of the Federal Public Administration (APF, in Spanish) for climate change on the integrated management of risks and the territory, health risks for the population, resistance of the existing strategic infrastructure and the design and construction of new such infrastructure, as well as the reduction of vulnerability and a higher resilience among productive sectors. The objectives includes 4 strategies and 32 lines of action.

Strategy 1.1	Strategy 1.2	Strategy 1.3	Strategy 1.4
Develop, strenghten and update those instruments necessary to reduce climate change vulnerability	Implement actions to reduce the risks of climate change in rural and urban populations	Strengthen strategic infrastructure and incorporate climate change criteria in the planning and construction thereof	Promote adaptation actions among the productive sectors
10 **Lines of action**	10 **Lines of action**	7 **Lines of action**	5 **Lines of action**

INDICATORS OF OBJECTIVE 1

Indicator
Percentage of progress in the development of instruments that help reducing the vulnerability of the population and the productive sectors of Mexico.

2014 Baseline Not Available

2018 Target 100%

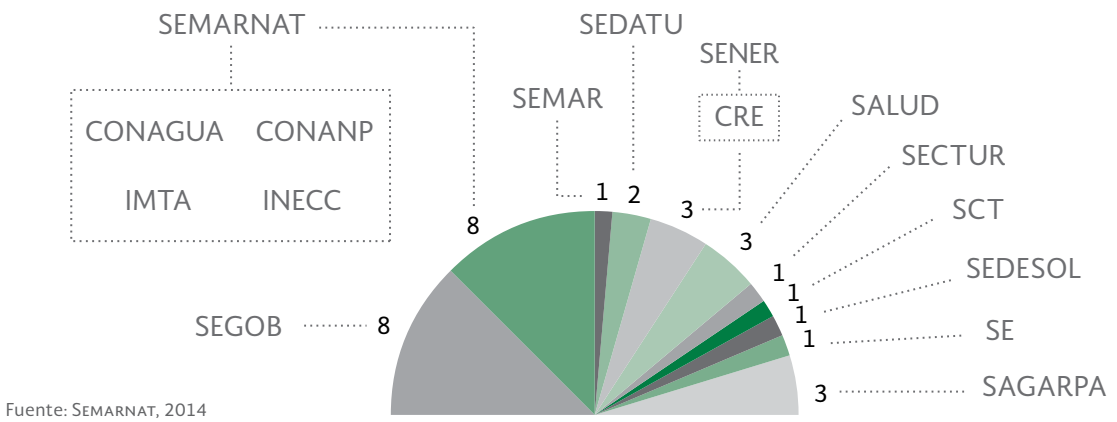
Indicator
Percentage of surface under Territory Ecological Management Programs, or developed urban development programs that include strategies or criteria on climate change mitigation or adaptation.

2013 Baseline 33%

2018 Target 75%

Shown below is the contribution of APF agencies to Objective 1, to its strategies and lines of action.

Figure 5. Contribution by APF agency to Objective 1



Fuente: Semarnat, 2014

Strategy 1.1 Develop, consolidate and update those instruments necessary to reduce climate change vulnerability

The aim of this strategy is designing and implementing territorial planning instruments, early risk detection and management which incorporate climate change criteria to reinforce decision-making and reduce the vulnerability of the population, the productive sector and the infrastructure of Mexico.

1.1.1 Consolidate the National Vulnerability Atlas. [INECC]
1.1.2 Consolidate the National Risk Atlas incorporating gender indicators. [Segob]
1.1.3 Implement prevention actions against water contingencies by means of the National Water Contingencies Prevention. [Conagua]
1.1.4 Develop regulating instruments to promote a resilient construction and urban development. [Semarnat]
1.1.5 Consolidate the modernization of the National Meteorological Service. [Conagua]
1.1.6 Modernize and increase institutional tide, meteorological, and motion recorder stations. [Semar]
1.1.7 Implement actions against droughts under the National Drought Program. [Conagua]
1.1.8 Incorporate climate change criteria to Fopreden. [Segob]
1.1.9 Consolidate the National Emergencies Center incorporating all early alarm systems. [Segob]
1.1.10 Develop an inventory of areas with potential high-risk areas to natural phenomena resulting from climate change. [Sedatu]

Receiving weather information for the GOES satellites. Source : SMN , 2014

Strategy 1.2 Implement actions to reduce the risks of climate change for rural and urban populations

Giving priority to disaster prevention is crucial to strengthen the climate change adaptation process. Undertaking specific actions in the territory, such as those contained in this strategy, as well as incorporating a climate change approach to programs, regulations and provisions with the participation of society would contribute to the reduction of the risks to which the population is exposed in case of climate change impacts.

1.2.1 Strengthen early alert systems, as well as prevention and mitigation actions in the event of extreme weather emergencies. [Conagua]

1.2.2 Increase te coverage of early alert systemts to provide timely notices to the population. [Segob]

1.2.3 Promote the creation of civil protection committees in disaster risk areas, with the participation of women of all ages. [Segob]

1.2.4 Reinforce the integrated risk management to address environmental contingencies in Natural Protected Areas (ANP, in Spanish) caused by climate changes. [Conanp]

1.2.5 Optimize climate events reponse programs in the hydrocarbon sector associated with basin and regional efforts. [Sener]

1.2.6 Design an early alert system with epidemiologic data of specific illnesses related to climate change events. [Salud]

1.2.7 Update the regulatory and program framework of the health care sector on sanitary risks associated to climate change. [Salud]

1.2.8 Establish strategies jointly with the local authorities that inhibit then urbanization in areas identified as having a potential high risk. [Sedatu]

1.2.9 Issue recommendations to construction regulations that include a climate change approach. [Segob]

1.2.10 Provide rain water collecting systems for domestic use in dwellings located in marginalized and poor areas. [Sedesol]

Girls in Guanajuato. Author: Gastón Yanes Esser, 2013

Strategy 1.3 Enhance strategic infrastructure and incorporate climate change criteria in the planning and construction thereof

Mexico's strategic infrastructure, including the communications, transportation, tourism and energy infrastructure, is vulnerable to climate change effects. Therefore, it is essential to incorporate to its design, construction, and useful life climate change criteria to reduce its vulnerability and increase its resistance.

1.3.1 Analyze the safety of dams and water infrastructure works. [IMTA]

1.3.2 Incorporate climate change criteria to energy infrastructure management plans. [SENER/CRE]

1.3.3 Develop programs on vulnerability management and a higher resistance of infrastructure considering also each area's ecosystem. [Sener]

1.3.4 Maintain and increase resilience levels of the communications infrastructure. [SCT]

1.3.5 Implement programs to have a national infrastructure with a higher capacity of resistance to natural phenomena. [Segob]

1.3.6 Promote an integrated risk management of water and urban, health care and educational infrastructure. [Segob]

1.3.7 Elaborate an assesment of the health care sector current strategic infrastructure , and incorporate a vulnerability approach to new projects. [Salud]

Facilities Pemex Gas and Basic Petrochemicals, Burgos. Tampico, Tamaulipas. Author: Carlos Cardenas, 2007

Strategy 1.4 Promote adaptation actions among the productive sectors

Mexico's productive sector is key to the economy and social welfare. Given the effects of climate change, this strategy intends to implement actions to reduce its vulnerability and ensure productivity and competitiveness.

1.4.1 Elaborate and disseminate vulnerability assessment, adaptation programs and early alert systems to climate change for top tourist destinations. [Sectur]

1.4.2 Carry out vulnerability studies of the industrial sector to climate change. [SE]

1.4.3 Elaborate the current environmental vulnerability municipal atlas for intensive husbandry. [Sagarpa]

1.4.4 Support the reconversion of crops to increase the resilience of producers. [Sagarpa]

1.4.5 Implement small rain water collecting and storage works to reduce agrucultural vulnerability in priority areas. [Sagarpa]

El Gato, Guanajuato. Author: Jorge Rebollar, 2013

INDICATOR	**Percentage of progress in the development of instruments which contribute to reducing the vulnerability of the population and of the country's productive sectors.**
General Description	This indicator measures the progress in the development, updating, or consolidation of assessment instruments of vulnerability or of national early alert systems by APF sector.

Observations

$$GA = a\left[\sum_{1}^{i} c_i(\text{gadiag}_i)\right] + b\left[\sum_{1}^{i} d_i(\text{gaalert}_i)\right], \text{ donde}$$

GA = Degree of progress;

a = coefficient of assessment instruments vulnerability (measured between 0 and 1);

b = coefficient of early alert systems (measured between 0 and 1);

c_i = weighting factor for assessment instruments obtained from dividing 1 by the number of assessment instruments considered in the indicator;

d_i = weighting factor for early alert systems obtained from dividing 1 by the number of early alert systems considered in the indicator;

gadiag_i = degree of progress of the assessment instrument *i* (measured between 0 and 100);

gaalert_i = degree of progress of the early alert system *i* (measured between 0 and 100).

The degree of progress (GA) may fluctuate between 0 and 100, where 100 indicate that all assessment instruments of vulnerability and risk reduction action have been developed, updated, or consolidated. Other conditions of the model are:

$$a + b = 1,$$

$$\sum_{1}^{i} c_i = 1$$

$$\sum_{1}^{i} d_i = 1$$

Periodicity	Annual
Source	www.semarnat.gob.mx
Additional References	Unit in charge of reporting the progress of the indicator: SEMARNAT's Office for Climate Change Policies.
2014 Baseline	Not Available
2018 Target	100%

INDICATOR	**Percentage of surface under Territory Ecological Management Programs (POET), or developed Urban Development Programs (PDU) that include strategies or criteria on climate change mitigation or adaptation.**
General Description	Percentage of the Mexican territory surface that has an Ecological Management Program or an Urban Development Program that incorporates strategies and/or criteria on climate change mitigation and/or adaptation.
Observations	The Territory Ecological Management Programs (POET) and the Urban Development Programs (PDU) are policy instruments which induce or regulate the land use; to this end, strategies, criteria or guidelines are established to integrate the environmental, social and economic contexts of the territory. These Programs are essential to achieve climate change adaptation and mitigation, as they can integrate directly the information on different scenarios for the regulation of the land use and occupation. The calculation method is: [(Surface with a regional or local Ecological Management Program, or an Urban Development Program which integrates climate change mitigation and/or adaptation strategies and/or criteria / Total of continental territory * 0.5) + (Surface with Marine Ecological Management Program which integrates climate change mitigation and/or adaptation strategies and/or criteria / Total Exclusive Economic Area * 0.5)] * 100. Those areas with higher climate vulnerability will have priority and these areas will develop strategic projects.
Periodicity	Every 2 years
Source	- Ecological Management: List of Ecological Management Programs with climate change mitigation and/or adaptation strategies and/or criteria available to the public at SEMARNAT's web page: http://www.semarnat.gob.mx/temas/ordenamientoecologico/Paginas/OrdenamientoEcol%C3%B3gico.aspx - Urban Development: List of official letters issued with the recommendations or acts of work meetings with the responsible areas in the three levels of the Administration.
Additional References	Unit in charge of reporting the progress of the indicator: SEMARNAT's Office for Climate Change Policies.
2013 Baseline	33%
2018 Target	75%

Objective 2. Preserve, restore, and manage ecosystems in a sustainable manner ensuring their environmental services for climate change mitigation and adaptation

Mexico has a great diversity of ecosystems which provide significant environmental services currently under threat. This objective sets 6 strategies and 45 lines of action aimed at strengthening the sustainable preservation, use, management and development of ecosystems to guarantee the environmental services which they provide and face the negative impacts of climate change.

Moreover, this objective intends to reinforce the community management of ecosystems, reduce environmental threats aggravated by climate change and develop instruments that enhance ecosystemic connectivity.

Strategy 2.1	Strategy 2.2	Strategy 2.3	Strategy 2.4	Strategy 2.5	Strategy 2.6
Promote models and actions for the protection, preservation and restoration of land, coast and marine ecosystems, as well as their diversity	Increase and enhance ecosystem connectivity	Implement sustainable agricultural, forest and fishing practices that reduce emissions and the vulnerability of ecosystems	Develop instruments that promote the sustainability and reduction of emissions from agriculture, forest and fishing activities, and that reduce the vulnerability of ecosystems	Reduce environmental threats aggravated by climate change	Integrated restoration and management of hydrological basins
10 Lines of action	6 Lines of action	8 Lines of action	10 Lines of action	6 Lines of action	5 Lines of action

INDICATOR OF OBJECTIVE 2

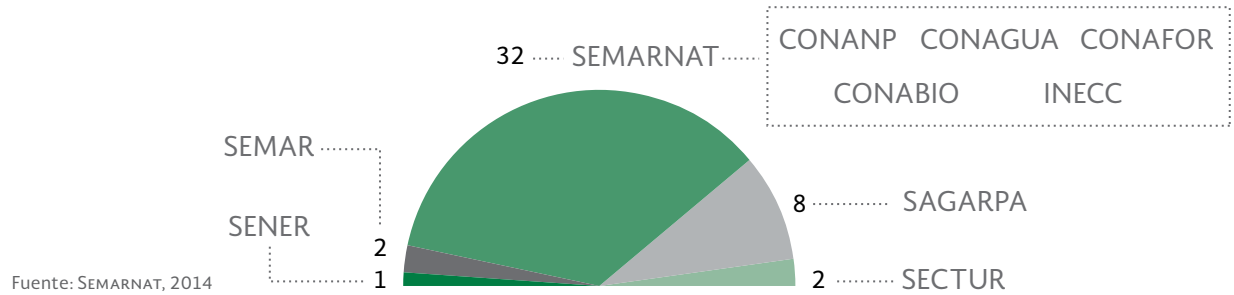
Indicator
Vulnerability Decline Index by means of infrastructure and actions for the preservation, restoration and sustainable management of the natural capital

2013 Baseline 0.2

2018 Target 0.6

Shown below is the contribution of APF agencies to Objective 2, to its strategies and lines of action.

Figure 6. Contribution by APF agency to Objective 2



Fuente: Semarnat, 2014

Strategy 2.1 Promote models and actions for the protection, preservation and restoration of land, coastal and marine ecosystems, as well as their diversity

This strategy aims at implementing climate change adaptation actions in Mexico which lead to reducing the vulnerability of ecosystems by means of their restoration, protection, and preservation.

2.1.1 Reforest and fully restore deteriorated forest areas, prioritizing ANPs. [Conafor]

2.1.2 Develop reforestation programs on the basins of hydroelectric power plants. [Sener]

2.1.3 Issue recommendations to reorient the Native Maize Conservation Program (Promac, in Spanish) to an agrobiodiversity conservation program. [Conabio]

2.1.4 Enhance actions that help protecting and preserving the marine environment. [Semar]

2.1.5 Develop guidelines with vulnerability criteria to grant concessions on land maritime federal areas. [Semarnat]

2.1.6 Implement preservation and restoration measures of threatened species with a higher vulnerability to climate change. [Semarnat]

2.1.7 Reinforce the management and operation of the Management Units System for the Conservation of Wildlife (SUMA). [Semarnat]

2.1.8 Assist in the recovery of mangroves with an impact on the coastlines. [Semar]

2.1.9 Implement Climate Change Adaptation Programs of marine, coastline and land ANPs, and their areas of influence. [Conanp]

2.1.10 Preserve and protect the genetic biodiversity with an emphasis on the conservation of native varieties. [Sagarpa]

Sumidero Canyon National Park. Source: Semarnat, 2012

Strategy 2.2 Increase and enhance ecosystem connectivity

The ecosystemic connectivity is essential to protect wildlife against the changes foreseen under climate change scenarios. This strategy contains actions oriented to promote this connectivity.

2.2.1 Promote ecological connectivity in ANPs by means of: biological corridors, integrated restoration, and other conservation modalities. [Conanp]

2.2.2 Identify priority habitats and evaluate their connectivity to preserve the biodiversity in the event of climate change. [Conabio]

2.2.3 Design indicators on the integrity of ecosystems which consider biological and socioeconomic parameters. [Conabio]

2.2.4 Apply instruments for the sustainable management of biodiversity in priority areas of CBMM and promote equal opportunities for men and women. [Conabio]

2.2.5 Implement projects for an integrated management of the landscape in areas vulnerable to climate change with an equitable participation of the population. [Conanp]

2.2.6 Increase the surface of marine, coast, and land PNA, as well as other conservation modalitiesotras modalidades prioritizing climate change vulnerable regions. [Conanp]

El Largo Ejido, Madera, State of Chihuahua. Author: Miguel Ángel Ayala Mata, 2014

Strategy 2.3 Implement sustainable agriculture, forest, and fishing practices which cut down emmissions and reduce the vulnerability of ecosystems

The strategy includes actions aiming at performing sustainable productive practices in the production sectors.

2.3.1 Avoid GHGs emmissions derived from deforestation and the degradation of woods by means of early actions in the territory. [Conafor]

2.3.2 Technify the agricultural surface by means of irrigation and protected agriculture to reduce climate vulnerability and increase and ensure the food supply. [Conagua]

2.3.3 Promote cattle production with land and cattle sustainable management and practices. [Sagarpa]

2.3.4 Implement sustainable forest management in relevant areas to an efficient use of forest resources. [Conafor]

2.3.5 Promote sustainable practices to keep the environmental services, and increase and preserve natural carbon drains. [Semarnat]

2.3.6 Promote sustainable community tourism projects, with a gender perspective in PNAs and/or vulnerable areas. [Sectur]

2.3.7 Promote co-generation in sugar factories. [Sagarpa]

2.3.8 Rehabilitate pasture areas with aeration rollers and sowing of grass in eroded lands. [Sagarpa]

Guanajuato. Author: Gloria Cuevas Guillaumin, 2013

Strategy 2.4 Develop instruments that promote the sustainability and reduction of emissions from agriculture, forest and fishing activities, and that reduce the vulnerability of ecosystems

This strategy considers the development of economic, legal, and technical instruments which incorporate climate change criteria to foster better practices in the productive sector and that promote side benefits during the development of the production chain.

2.4.1 Develop and incorporate climate change criteria to regulations, management and administration models in line with the Conduct Code for Responsible Fishing. [Sagarpa]

2.4.2 Develop studies and certificates of pasture lands and types of lands coefficients in agriculture properties to have a sustainable use of natural resources. [Sagarpa]

2.4.3 Establish community forest regulations. [Conafor]

2.4.4 Develop internationally established components for emission reduction activities due to deforestation and forest degradation under the REDD+ model. [Conafor]

2.4.5 Foster an integrated land management that incorporates the enhancement of intergovernmental cooperation mechanisms to favor adaptation and mitigation. [Conafor]

2.4.6 Design a promotion instrument to increase carbon reservoirs in soils. [Semarnat]

2.4.7 Incorporate sustainable development, adaptation and solutions to the production chain of maize and wheat. [Sagarpa]

2.4.8 Grant liquid guaranties to promote projects with benefits to the environment and the mitigation of climate change. [Sagarpa]

2.4.9 Develop climate change criteria to assess the environmental impact of works on coast ecosystems. [Semarnat]

2.4.10 Develop a sea grass management strategy to quantify and preserve CO_2 capture*. [Semarnat]

* This line of action is subject to securing domestic or international resources.

Reforestation. Source: Semarnat, 2014

Conservation. Source: Semarnat, 2014

Strategy 2.5 Reduce environmental threats aggravated by climate change

Climate change favors the recurrence of phenomena such as wildfires and the presence and settlement of invading species in several habitats. This strategy aims at preventing these threats and ensure the conservation of ecosystems.

2.5.1 Establish agreements with producers and the organized civil society to eradicate agriculture fires in CBMM priority areas. [Conabio]

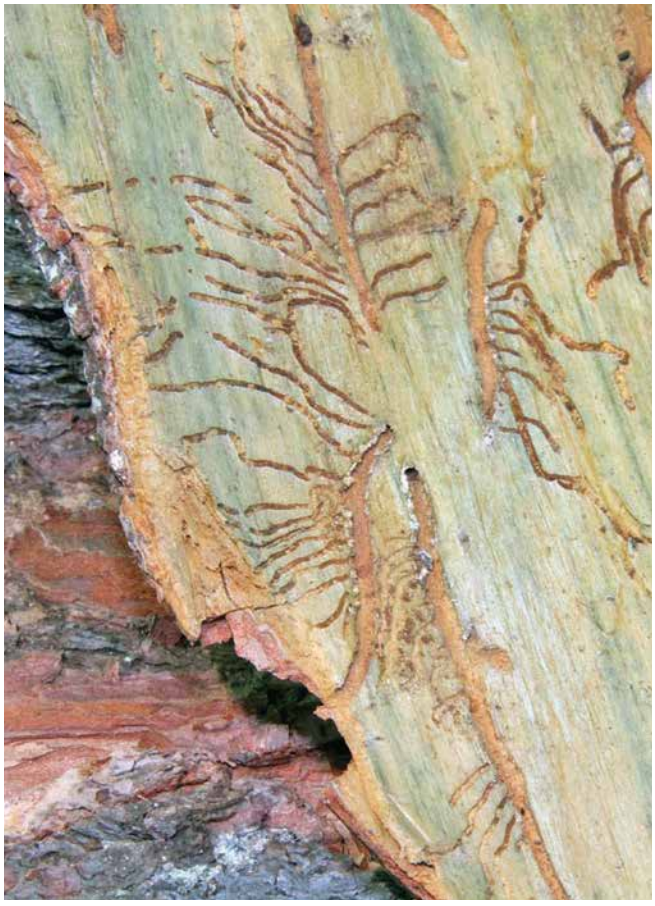
2.5.2 Implement action plans for plague control in the most affected communities. [Conafor]

2.5.3 Evaluate the vulnerability to climate change of priority species and propose strategies for their management and conservation. [Conabio]

2.5.4 Enhance the research on the interaction and synergies of invading species in a climate change scenario. [Conabio]

2.5.5 Generate satellite information to have an early alert of wildfires. [Conabio]

2.5.6 Develop the National Forest Plant Health Strategy. [Semarnat]



Bark beetle gallery. Source: Semarnat, 2014

Lionfish. Source: Semarnat, 2014

Strategy 2.6 Restoration and integrated management of hydrological basins

This strategy includes land actions with a hydrological basin approach that allow the development of an integrated management of the territory and its resources, as well as get the population and all parties involved in their management.

2.6.1 Establish national surface waters for environmental protection. [Conagua]

2.6.2 Carry out actions to increase aquifer replenishment. [Conagua]

2.6.3 Focus payment models by environmental services on strategic areas for the conservation of basins and ecosystems. [Conafor]

2.6.4 Promote actions to reestablish the water cycle balance in priority tourist destinations. [Sectur]

2.6.5 Create a baseline to calculate emissions and absorptions by sinks in the agricultural sector and the USCUSS. [INECC]

Aquatic Ecosystem. Source: Semarnat, 2012

Protected Natural Area. Source: Conanp, 2013

Indicator for Objective 2

INDICATOR	**Vulnerability Decline Index by means of infrastructure and actions for the preservation, restoration and sustainable management of the natural capital.**
General Description	The condition of ecosystems is essential to carry on with socioeconomic activities and reduce the adverse effects of natural disasters. The conservation and restoration of ecosystems, as well as their sustainable use is critical in the adaptation process. Therefore, resilience is increased to the extent climate change vulnerability is reduced. To estimate the contribution of the environmental sector to diminishing the vulnerability of ecosystems and the population to phenomena associated with climate change this indicator groups a series of variables that reflect the actions of this sector to preserve, restore and manage in a sustainable manner the natural capital, as well as the development and improvement of the related infrastructure and the contribution to protect the population.
Observations	The index consists of five elements: C1. Natural Capital Deterioration - Percentage of the vegetation surface affected by fires, plagues and diseases. - Degree of deterioration by area with national waters availability by state. C2. Natural Capital Restoration - Percentage of treated waste waters with respect to collected waters. - Percentage of surface with land reforestation, conservation, and restoration actions with respect to eligible surface. C3. Natural Capital Conservation - Percentage of national surface with Management Units for the Conservation of Wildlife. - Percentage of priority species and species under risk considered in PROCER which have conservation actions (PACE). - Percentage of remaining natural vegetation surface with lands receiving a payment for environmental services. - Percentage of land surface (continental and insular) protected under a federal PNA. C4. Integrated territory management plans - Percentage of land surface with territory ecological management plans or programs urban development programs that include climate change mitigation or adaptation strategies or criteria. - Percentage of the Exclusive Economic Area with marine ecological management that include climate change mitigation or adaptation strategies or criteria. - Percentage of land with community forest management plans. - Percentage of national surface with (federal) Protected Natural Areas which has a management plan.

Observations	C5. Infrastructure to reduce vulnerability - Percentage of hectares benefited from hydrological-environmental restoration works, water management or technologically rain-fed land rehabilitation. - Percentage of hectares benefited from protection works to population centers and production works (construction of dams, embankments and control of waterways, among others). - Percentage of residues that are handled under an integrated model. Component four (C4) is included as a proxy of the efforts from the sector to acknowledge the socio-environmental functionality of the territory. Worth noting is that this index incorporates the degree of deterioration of the natural capital estimated by the sector. Each variable will be normalized in accordance to the calculated range of values. All variables will have the same importance. The proposed calculation method is: $IDV = \frac{\sum_i^N c_i}{N}$ $c_i = \frac{\sum_i^n V_i}{n}$ Where: N = = Number of components of the index n = Number of variables per component c_i = *N-th* Component V_i = *N-th* Variable The final result is a value within a range of 0 to 1, where 1 means the maximum reduction of vulnerability attainable by the sector under the variables considered.
Periodicity	Every 2 Years
Source	National System of Environmental Information and Natural Resources: http://www.semarnat.gob.mx/informacionambiental/Pages/sniarn.aspx National Waters Commission: a) National Water Information System http://www.conagua.gob.mx/Contenido.aspx?n1=3&n2=60&n3=60, b) Water statistics in Mexico http://www.conagua.gob.mx/Contenido.aspx?n1=3&n2=60&n3=106 Federal Law on Rights http://www.diputados.gob.mx/LeyesBiblio/pdf/107.pdf INEGI: Environmental Statistics Search System http://mapserver.inegi.org.mx/dsist/ambiental/map/indexV3FFM.html. Bi-yearly Reports of the Land Management Program Quarterly and annual reports of operating programs Environmental Policy and Regional and Sector Integration Office http://www.semarnat.gob.mx/temas/ordenamientoecologico/Paginas/OrdenamientoEcol%C3%B3gico.aspx Wildlife Office Annual reports of the Management Units (MUs) CONANP http://procer.conanp.gob.mx/
Additional References	Unit in charge of reporting the progress of the indicator: SEMARNAT's Office for Climate Change Policies
2013 Baseline	0.2
2018 Objective	0.6

Compound and greenhouse gases emissions in Mexico

According to the 1990–2010 National Inventory of Green House Gas Emissions (INEGEI) the total of emissions in Mexico in 2010 were 748 MtCO2e, a value 19% higher than that reported by INEGEI for the years 2001-2010.

As regards fossil fuel burning, Mexico was the world's 12th country with 1.4% of global emissions in 2010, as shown in Figure 7. If the country continues with this trend, it is estimated that by 2020 GHGs emissions in Mexico would reach approximately 1,000 $MtCO_2e$.

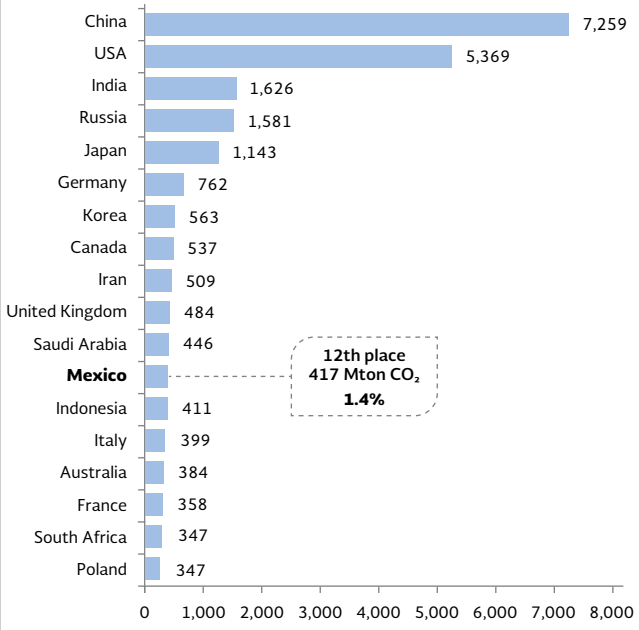
The LGCC considers the indicative objectives and aspiration goals by which Mexico agrees to reduce compound and GHG emissions by:

» 30% in 2020 with respect to the baseline.

» 50% in 2050 with respect to the emissions recorded in 2000.

Likewise, the Climate Change General Law LGCC establishes the commitment to generate 35% of electricity from clean sources by the year 2024.

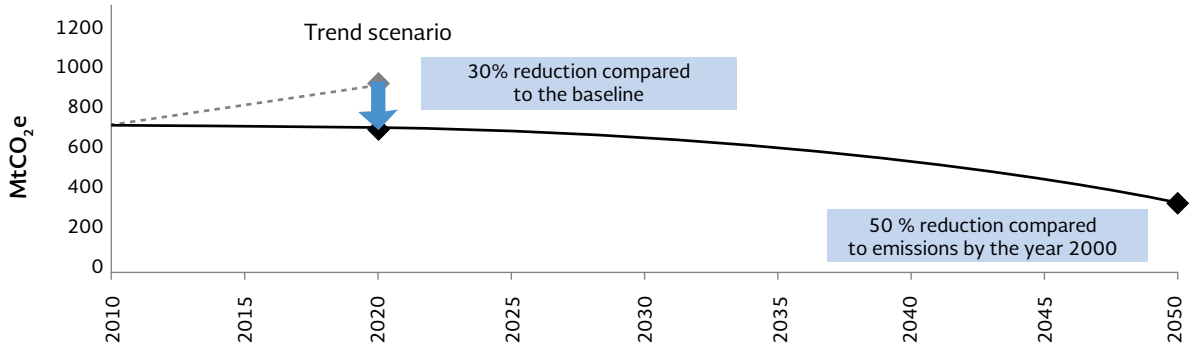
Figure 7. CO_2e emissions derived from fossil fuel burning by country in million tons



Emissions of Mexico in the IEA 2012 international scene. Emissions from Fuel Combustion.

Source: IEA 2013. CO_2e Emissions from Fuel Combustion.

Figure 8. National mitigation objectives by the years 2020 and 2050



Source: Semarnat, 2014

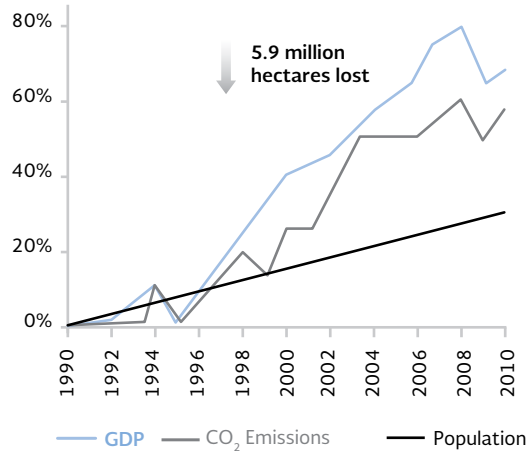
Photovoltaic Power Station. Source: Semarnat, 2012

Wind Power Station, state of Coahuila. Source: Semarnat, 2012

In order to advance towards a low emission development and a more competitive economy, Mexico must undertake actions oriented to disassociate its GDP growth from CO_2e emissions.

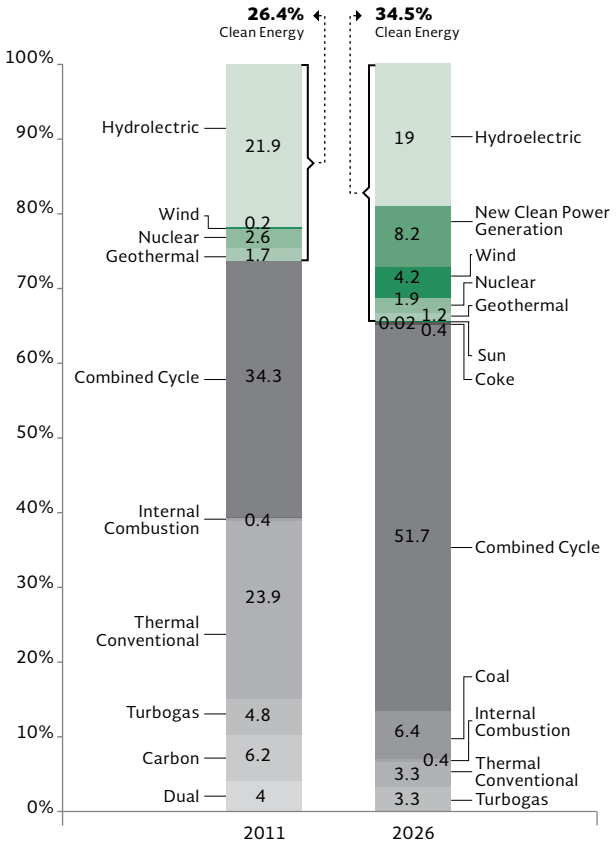
This Program identifies actions to cut down emissions in the primary, industrial and construction sectors, as well as in urban, tourist and transportation services, in addition to promote the use of highly efficient energy systems and technologies with a low or zero generation of these pollutants.

Figure 9. Economic and population growth, and compound and GHG emission



Source: Semarnat, 2014

Figure 10. Share of power generation technologies in the total capacity, 2011 and 2026



Source: Semarnat, 2014 with data from Electrical Sector Prospective Study 2011-2026, Sener

Short-lived Climate Pollutants (SLCPs)

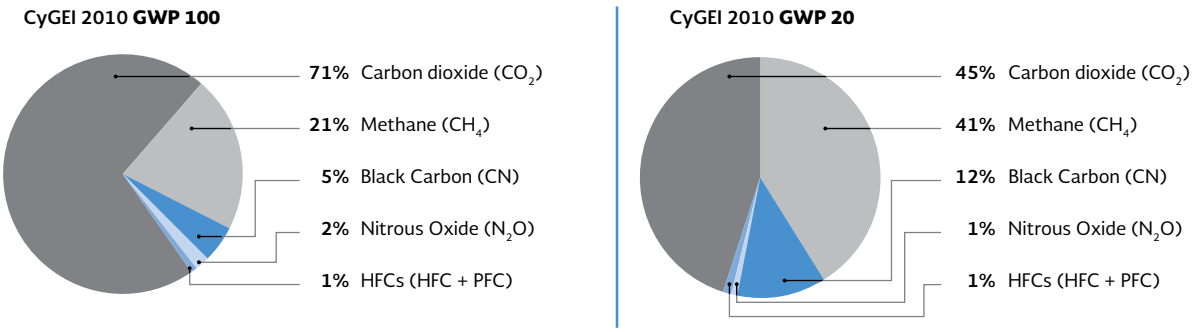
In addition to GHGs there other pollutants known as Short-lived Climate Pollutants (SLCPs), or "short-lived climate forcers".[31] At the same time, the reduction of SLCPs helps to reduce climate change mitigation in the short term and to improve the quality of air, reduce health risks and enhance crop productivity. The SLCP half-life is less than 20 years and therefore, they may reduce rapidly with the existing technology.

Due to Mexico's social and economic conditions and to the provisions of the LGCC which establishes that mitigation actions with the highest reduction potential at the lower cost entailing environmental, economic and social benefits must be prioritized, this Program includes a specific objective to reduce SLCPs.

The SLCPs considered in the PECC 2014-2018 are methane, black carbon, precursors or troposhperic ozone, and some hydrofluorocarbons. The selection of these pollutants is consistent with the Vth Assessment Report of the IPCC. This report identifies methane (CH4) and black carbon (CN) emissions as the most relevant due to their contribution in absorbing solar radiation and in the total human-induced radiative forcing.

The next figure shows the emissions from Mexico in 2010 by different climate pollutants in connection with their global warming potential in 20 and 100 years showing how the use of global warming potential may over- or underestimate the impact of methane and black carbon emissions. The 20-year warming potential best reflects the mitigation that may be attained in the short term.

Figure 11. CO_2 emissions from Mexico equivalent in 2010 calculated with a 20 and 100 year GWP



Source: Semarnat, with details INECC, 2013

The PECC 2014-2018 mainly focuses on methane mitigation actions in the waste, livestock, agriculture and oil sectors, as well as on the reduction of black carbon in the transportation and agriculture sectors. HFC reduction is linked to the residential and industrial sectors.

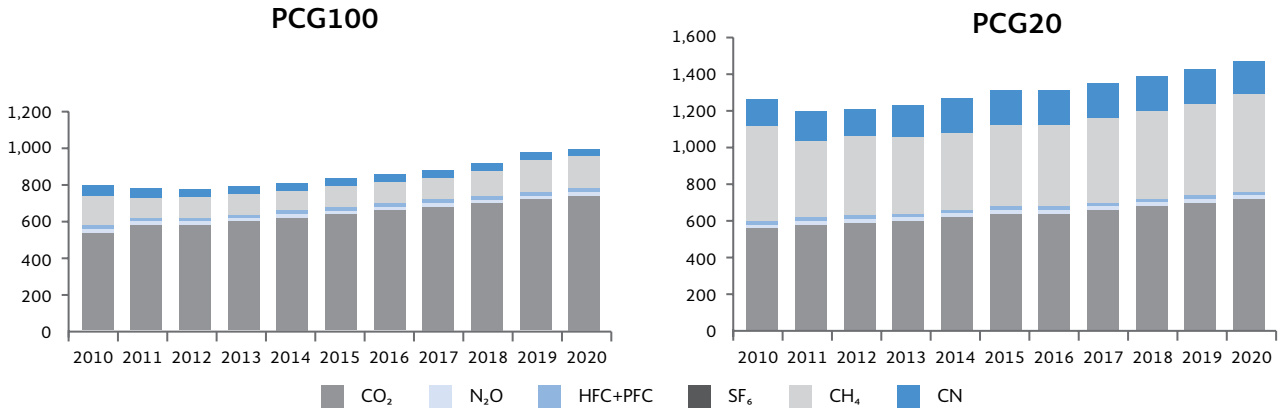
Worth mentioning is that the approach given to SLCPs in the Program is supplementary and does not replace actions to reduce GHGs. To assess the reduction in the emission of SLCPs specific reduction indicators are used for each pollutant.

The figures below show the projections of GHG and SLCP emissions in Mexico quantified under an inertial or baseline scenario.[32] As it may be seen, in a 20-year horizon the SLCPs have a comparable relevance to GHGs, with the additional advantage that their mitigation may result in a rapid slowdown of global warming and a short-time improvement in the quality of air..

[31] According to the Vth Assessment Report of the IPCC Climate Change Intergovernmental Panel, as well as the Climate and Clean Air Coalition (CCAC).

[32] There are uncertainties associated to the quantification of the impact of these pollutants on climate. For black carbon, the associated regional effect, its permanence time in the atmosphere, as well as the estimation of its emissions, all contribute to this uncertainty. Therefore, establishing the benefits of reducing this compound requires a careful analysis in the use of metrics, such as the GWP. (Bond, T. 2005, Jacobson, M. 2007, Rypdal, K. 2009).

Figure 12. Compounds and greenhouse gases, $MtCO_2e$



Source: DGPCC, with data from INECC, 2013

The following tables show in detail the emission calculation for each INEGEI sector, with 100 and 20-year GWP factors, and include GHGs regulated under the Kyoto Protocol and black carbon. Sectors are prioritized according to the magnitude of their emissions projected to the year 2020 with a 20-year GWP.

Table 2. GHG emission calculations with 100 and 20-year GWP factors

SECTOR	GHGH EMISSIONS in 2012		GHG EMISSION PROJECTION to 2020	
	PCG 100 GEI ($MtCO_2e$)	PCG 20 GEI ($MtCO_2e$)	PCG 100 GEI ($MtCO_2e$)	PCG 20 GEI ($MtCO_2e$)
Transportation	205.2	206.9	272.2	273.3
Oil & Gas	81.8	171.5	111.9	228.8
Industry	125.9	152.4	191.5	228.4
Residues	48.5	139.8	72.0	199.6
Agriculture	101.4	181.5	111.1	198.8
Power generation	135.5	135.9	161.7	162.2
Forest	59.6	59.6	59.6	59.6
Residential	25.6	25.7	29.3	29.3
Total	**783.5**	**1,073.3**	**1,009.3**	**1,380.0**

Source: Semarnat, with data from INECC, 2013

Table 3. Black Carbon emission calculations with 100 and 20-year GWP factors

SECTOR	BLACK CARBON EMISSIONS in 2012		BLACK CARBON PROJECTION to 2020	
	PCG 100 CN ($MtCO_2e$)	PCG 20 CN ($MtCO_2e$)	PCG 100 CN ($MtCO_2e$)	PCG 20 CN ($MtCO_2e$)
Oil & Gas	11.5	41.0	12.8	45.4
Residential	6.2	22.0	6.2	22.1
Transport	3.2	11.5	3.9	13.8
Agriculture	3.4	11.9	3.7	13.2
Residues	2.2	7.9	2.4	8.7
Industry	1.2	4.3	1.6	5.7
Forestry	0.8	2.9	0.8	2.9
Power generation	0.0	0.1	0.0	0.0
Total	**28.5**	**101.6**	**31.4**	**111.8**

Source: Semarnat, with data from INECC, 2013

Figure 13. Main emission sources of compounds and GHGs projected to 2020 under an inertial scenario

TRANSPORTATION
94% of emissions come from cars,[33] 3.3% from aircrafts, 1.4% from sea transportation, and 1% from railways.

OIL & GAS
Combustion, venting, and leaks of natural gas and energy consumption of Pemex facilities.[34]

INDUSTRY
Fossil fuel consumption for manufacturing and emissions derived from industrial processes, mainly in the iron, steel, and cement industries.[35]

RESIDUES
Landfills, controlled sites, wastewater treatment and residue open air burning.[36] The increase in emissions will come from the population growth and from a higher generation of urban solid waste *per capita*.

AGRICULTURE
Methane and nitrous oxide from the enteric fermentation of bovine populations, decomposition of excrement, rice paddies, burning and decomposition of agricultural waste, incorporation of nitrogen to soils by way of synthetic fertilizers and biological fixation. Black carbon would come from burning of agricultural products and the use of machinery.

POWER GENERATION
The 2013-2027 Electrical Sector Prospective Study 2013-2027 of Sener anticipates an annual average increase of 4.5% in the consumption of electrical power. It is estimated that by 2020 the generation of electricity will come 76% from fossil fuels, 21% from renewable energies, and the rest from the use of other technologies. The generation from fossil fuels will consist 80% of natural gas, 12% of coal, 7% of fuel oil, and 1% of diesel.

FORESTRY
Conversion of woodlands and other vegetation surfaces for agricultural uses, change of contents of carbon in the soil, and changes to the biomass and other reservoirs.[37] It is estimated that the trend of emissions to the year 2020 will be constant, if deforestation rates do not change or decrease, as it has been the case from 1990 to 2010, according to data from Conafor.

RESIDENTIAL
Energy consumption to meet lighting, thermal conditioning and food cooking needs; they are projected to be 51.4 $MtCO_2e$ by the year 2020 which will account for a 7.8% increase.

[33] The 2013-2027 Crude Oil and Oil Products Prospective Study estimates a growth in the consumption of gasoline and diesel resulting from an annual 3.8% rise in the number of vehicles using gasoline, as well as an annual 5.1% increase in diesel vehicles.

[34] In 2012 emissions from this sector consisted mainly of CH_4, CO_2, and black carbon. Methane emissions came from natural gas burning, venting, and leaks; those of CO_2 and black carbon resulted from combustion processes; and N_2O emissions came from fuel combustion. Black carbon derived from fossil fuel combustion accounted for 11.5 or 41 $MtCO_2e$, using GWP100 or GWP20, respectively.

[35] Nearly 50% of emissions corresponds to energy consumption; 30% to the cement and chalk industries; and 13% to consumption due to HFC potential emissions, particularly HFC-134A and HFC-23, as a byproduct of HFC-22 and HFC-125.

[36] It is estimated that in rural areas the burning of residues generates 2.4 Gg of black carbon emissions, equal to 4.4% for GWP100 and 5.4% for GWP20 of the total emissions of this sector. Such increase in emissions is due to an expected growth by the year 2020 of approximately 8% in the total number of livestock, as well as a rise in the production of grains and oil seeds.

[37] The conversion of woods and prairies to pastures and sowing fields gives rise to changes in carbon reservoirs of the vegetation and soils; nearly 70% of total emissions come from this subcategory. Worth noting is that the gradual abandonment of agricultural lands is a significant sink in the net balance.

To help attaining the compound and GHG emission reduction objectives contained in the LGCC, this PECC 2014-2018 proposes two objectives:

OBJECTIVE 3
Reduce GHG emissions to orient Mexico towards a competitive economy and a development with low emissions

Transport		Oil and gas	
Industry		Agriculture	
Residues		Power generation	
Forestry		Residential	

OBJECTIVE 4
Reduce short-lived climate pollutant emissions, promoting side benefits for the health and well-being

Black Carbon	BC
Methane	H C H H H
Hydrofluorocarbons	

Plant scrapping. Author: Ximena Aristizabal, 2014

Pame Women Community El Mezquital. Author: Miguel Pérez Torres, Sustainability Project Communities, Centro Mario Molina, 2013

Objective 3. Reduce GHG emissions to orient Mexico towards a competitive economy and a development with low emissions

This objective intends to trigger cost effective actions with environmental side benefits and with a significant impact on the mitigation of GHGs in those sectors with the highest estimated growth in emissions by the year 2020. It is oriented to implement actions that are efficient in terms of energy, co-generation, use of clean energy sources, and sustainable mobility models. It contains 6 strategies and 52 lines of action. Likewise, this objective includes a strategy to promote and facilitate the participation of the private sector in the development of Nationally Appropriated Mitigation Actions (NAMAs).

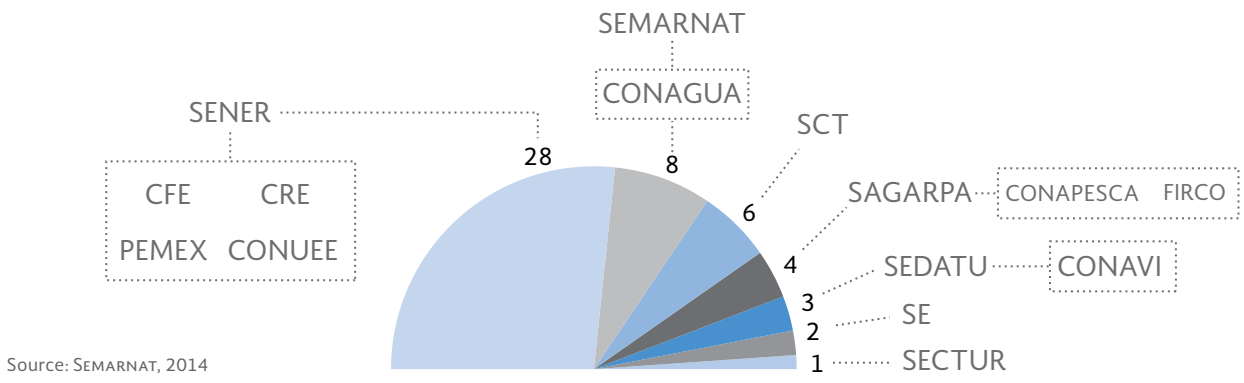
Strategy 3.1	Strategy 3.2	Strategy 3.3	Strategy 3.4	Strategy 3.5	Strategy 3.6
Perform projects and actions of energy efficiency	Accelerate the energy transition to energy sources that are less carbon intensive	Develop tools and instruments to streamline the energy transition	Promote and facilitate emission reduction actions of the private sector	Develop sustainable transportation and mobility models	Promote the development of NAMAs
9 Lines of action	9 Lines of action	9 Lines of action	7 Lines of action	9 Lines of action	9 Lines of action

INDICATORS OF OBJECTIVE 3

Indicator Million Annual Tons of CO_2 equivalent to ($MtCO_2e$) mitigated by PECC and calculated with a 100 and 20-year Global Warming Potential (GWP100 and GWP20)	**Indicator** Tons of equivalent CO_2 emitted per MegaWatt/hour generated (tCO_2e/MWh)
2014 Baseline 0 $MtCO_2e$ mitigated	**2014 Baseline** 0.456 tCO_2e/MWh
2018 Target 83.2 $MtCO_2e$-(GWP100)/year mitigated	**2018 Target** 0.350 tCO_2e/MWh

Here is a list of contributions from APF Agencies to this objective 3, to its strategies and lines of action.

Figure 14. Contribution of APF Agency to Objective 3



Source: Semarnat, 2014

Strategy 3.1 Perform energy efficiency projects and actions

This strategy seeks to promote GHGs mitigation in the oil & gas sectors, as well as in those of energy generation and use, agriculture and fishing by means of actions that promote a higher efficiency in the generation and use of energy. It encompasses measures which include issuing standards, more efficient agricultural practices, co-generation, and the use and capture of CO_2.

3.1.1 Implement GHG reduction projects in Pemex operations with energy and operational efficiency, gas burning, venting and use. [Pemex]

3.1.2 Promote energy efficiency by means of:
- Official Mexican Norms
- Public Lighting
- Real Property, Facilities and Vehicles of APF [Conuee]

3.1.3 Implement sustainable agricultural practices, the generation and use of renewable energies, energy efficiency, and generation and use of biomass. [Sagarpa]

3.1.4 Design the CCUS* critical path and implement pilot projects in CFE, as well as an improved oil recovery in Pemex. [Sener/Pemex/Cfe]

* Carbon Capture, Use and Storage.

3.1.5 Support the substitution of engines in fishing vessels with more efficient engines. [Sagarpa]

3.1.6 Establish programs that increase energy efficiency in the electricity generation, transmission and distribution processes. [CFE]

3.1.7 Promote the use of small and large scale distributed energy generation models. [Conuee]

3.1.8 Encourage investment in smart grids that streamline the incorporation of variable renewable energies and loss reduction. [Sener/CFE/CRE]

3.1.9 Publish efficient co-generation methodologies using bioenergetic sources. [CRE]

Strategy 3.2 Accelerate the energy transition to less intensive carbon energy sources

This strategy includes the oil & gas sectors, the generation and use of energy, as well as the transportation, residue disposal and agriculture sectors. Implementing these lines of action will allow for a faster diversification of energy sources, giving priority to renewable sources, natural gas and biofuels derived from waste. It also promotes a better efficiency in distribution grids and in the electrification of rural areas.

3.2.1 Promote the diversification of the energy matrix with public and private using clean energies. [Sener/CFE/CRE]

3.2.2 Displace the use of diesel and fuel oil from the energy matrix and replace them with less intensive carbon sources. [CFE]

3.2.3 Promote the medium and low enthalpy geotheram use for thermal purposes. [Sener]

3.2.4 Implement pilot or demonstration projects for the use of non-edible residues and substances for the production of biofuels. [Sener]

3.2.5 Develop biofuel use programs and, if applicable, of mixes to generate electricity and heat for the transportation sector. [Sener]

3.2.6 Implement biofuel introduction concept tests under regionalized production, transportation, and commercialization models. [Sener]

3.2.7 Promote the development of solar thermal power generation. [Sener]

3.2.8 Develop policies and measures to ensure the supply of natural gas. [Sener]

3.2.9 Facilitate the social inclusion of the population far from urban centers by the electrification of rural areas with renewable energies. [Sener]

Strategy 3.3 Develop tools and instruments which facilitate the energy transition

This strategy considers the improvement of regulations, the simplification of procedures, and the incorporation of environmental criteria, as well as external factors in those programs and projects focused on Mexico's energy source transition.

3.3.1 Publish and update the National Inventory of Renewable Energies. [Sener]
3.3.2 Incorporate external environmental factors in assessing projects, and power generation of all technologies, incorporating life cycle criteria. [CFE]
3.3.3 Regulate and promote renewable energies and clean energies to consolidate Mexico as a low-carbon economy. [Semarnat]
3.3.4 Develop environmental criteria to incorporate regulation instruments for gas and shale oil exploration and exploitation activities. [Semarnat]
3.3.5 Review and adapt to the effective regulations on permits required to generate electricity with renewable sources. [CRE]
3.3.6 Implement simplified administrative processes to develop renewable energy projects making use of the National Single Window. [Sener]
3.3.7 Promote the standardization of the electricity generation sector focusing on renewable energies, efficient co-generation systems and smart grids. [CRE]
3.3.8 Implement Pemex Climate Action. [Pemex]
3.3.9 Implement polluting emissions reduction programs in the power generation sector. [CFE]

Strategy 3.4 Promote and facilitate emission reduction actions of the private sector

This strategy intends to trigger energy efficient actions in the private sector, as well as expanding the participation of this sector in supplying electrical power.

3.4.1 Promote policies to increase the better use of efficient co-generation potentials in the end-consumer sectors. [Conuee]
3.4.2 Promote energy efficiency actions in tourist Micro, Small, and Medium Companies (MIPyMES), mainly in hotels and restaurants. [Sectur]
3.4.3 Promote the energy distributed generation in the residential, commercial, and industrial sector. [Sener]
3.4.4 Remove larger fishing boats. [Sagarpa]
3.4.5 Develop value chains of the domestic production from renewable energy sources. [Sener]
3.4.6 Support entrepreneurs and MIPyMES in the renewable energies supply market. [Sener]
3.4.7 Enhance programs for water solar heater use in the end-consumer sectors. [Conuee]

Strategy 3.5 Develop sustainable transportation and mobility models

This strategy is aimed at a sector with the highest growth of emissions. It includes actions focused on increasing efficiency and reducing the consumption of fuels in the cargo and passenger transportation sectors. Likewise, it promotes the railway and sea transportation and supports sustainable mobility models in urban centers with populations over 500,000.

3.5.1 Design and implement a sustainable mobility policy for cities with 500,000+ inhabitants. [SEDATU]
3.5.2 Develop urban coexistence projects which increase the speed of cargo transportation and improve safety on the streets. [SCT]
3.5.3 Promote the efficient use of the railway in cargo transportation to reduce transportation costs and the emission of pollutants. [SCT]
3.5.4 Promote the modernization of cargo transportation to reduce operations costs and emissions, and to enhance its competitiveness and safety. [SCT]
3.5.5 Reduce GHGs and pollutants under the Clean Transportation Program. [SEMARNAT]
3.5.6 Build passenger interurban railways with an integrated vision that considers the regional development and demographic projections. [SCT/BANOBRAS]
3.5.7 Promote key massive transportation projects with lower travel times, socioeconomic profitability and environmental impact criteria. [SCT/BANOBRAS]
3.5.8 Encourage coastal and short-distance sea transportation to promote it as an alternative to the shipping of goods. [SCT]
3.5.9 Progress to fuel saving logistics practices. [SE]

Strategy 3.6 Promote the development of NAMAs

This strategy proposes the development of mitigation actions which do not have now a federal budget for their design and implementation, and therefore require technical and economic resources from national, international, public, and private sources. Their development involves deep transformations to eliminate barriers and promote a sustainable development, in addition to GHG mitigation. The development of NAMAs implies sound MRV systems and synergies in the public and private sectors. The estimated mitigation of the NAMAs considers in this strategy is 1.58MtCO_2e/year.

3.6.1 Promote NAMA projects creditable for urban transportation. [SEDATU/SEMARNAT]
3.6.2 Promote NAMA projects in the housing sector. [SEDATU]
3.6.3 Promote NAMA projects creditable for the brick manufacturing industry. [SEMARNAT]
3.6.4 Promote NAMA projects for sugar factories. [SEMARNAT]
3.6.5 Promote NAMA projects for the sea sector. [SEMARNAT]
3.6.6 Promote a NAMA project for the conservation and restoration of livestock and agriculture lands in Mexico. [SAGARPA]
3.6.7 Promote NAMA projects for schools. [SEMARNAT]
3.6.8 Promote financing mechanisms for NAMAs in the private sector. [SE]
3.6.9 Promote NAMA projects for the energy valorization of rural residues. [SEMARNAT]

Indicators for Objective 3

INDICATOR	Million annual tons of CO2 equal to ($MtCO_2e$) mitigated by PECC 2014-2018 and calculated with a 100 and 20-year Global Warming Potential (GWP100 and GWP20)
General Description	This indicator represents a basis to monitor reductions from actions undertaken by APF for which it is possible to calculate mitigation with a higher certainty.
Observations	It is an indicator that includes the mitigation of lines of actions for objectives 2 through 4 of the PECC 2014-2018, using calculation methodologies based on international standards certified by IPCC.
Periodicity	Annual
Source	Annual reports of the agencies, and estimated calculations of INECC and SIAT-PECC. Annual PECC 2014-2018 progress report on Semarnat's web site.
Additional references	Unit in charge of reporting the progress of the indicator: Semarnat's Office for Climate Change Policies.
2013 Baseline	0 $MtCO_2e$ mitigated
2018 Traget	83.2 $MtCO_2e$-(PCG100)/year mitigated* 95.97 $MtCO_2e$-(PCG20)/year mitigated

* Furthermore, the PECC 2014-2018 quantifies the potential mitigation of 9.4 $MtCO_2e$-GWP100 (18.9 $MtCO_2e$-GWP20) of NAMA's 5 lines of action subject to obtaining domestic or international financial and technological support, whether public or private (See Methodology Attachment in: www.dof.gob.mx/nota_detalle.php?codigo=5342492&fecha=28/04/2014).

INDICATOR	Tons of equivalent CO_2 emitted by generated MegaWatt/hour (tCO_2e/MWh)
General Description	The generation of emissions reported by the Federal Electricity Commission as an emission factor of the grid for the public service of electric power. It is an indicator of the carbon footprint intensity in the generation of power, as it reflects the effective incorporation of renewable energies, clean technologies, and change of fuels with less carbon intensive sources in the National Power System.
Observations	The indicator is related to the implementation of Objective 5 of the 2013-2018 Energy Sector Program and promotes energy efficiency, as well as a social and environmental responsibility.
Periodicity	Annual
Source	Federal Electricity Commission, reports of the National Emission Registry, annual PECC 2014-2018 progress report on Semarnat's web site.
Additional references	2013-2017 Prospective Study of the Power Sector, Sener. Unit in charge of reporting the progress of the indicator: Semarnat's Office for Climate Change Policies.
2013 Baseline	0.456 tCO_2e/MWh
2018 Target	0.350 tCO_2e/MWh

Objective 4. Reduce short-lived climate pollutant emissions, promoting side benefits for the health and well-being

Objective 4 is focused on reducing SLCPs emissions and considers 5 strategies and 29 lines of action grouped by type of pollutant. The strategies are oriented to reducing coolants, black carbon and methane, to developing regulatory instruments, and designing NAMAs. The development of those actions considered for each strategy will allow to have regular and reliable information, involve different sectors of society in the control of SLCPs emissions, and control and regulate directly the generation sources.

Strategy 4.1	Strategy 4.2	Strategy 4.3	Strategy 4.4	Strategy 4.5
Use technologies and fuels that reduce the emission of black carbon and improve the quality of air and public health	Reduce methane emissions in waste water treatment plants, landfills, and in the oil and agricultural sectors.	Control the emission of coolants with high contents of PCG	Develop regulatory and promotion instruments to regulate the emissions of SLCPs	Promote the development of NAMAs that reduce SLCPs
6 Lines of action	6 Lines of action	3 Lines of action	10 Lines of action	4 Lines of action

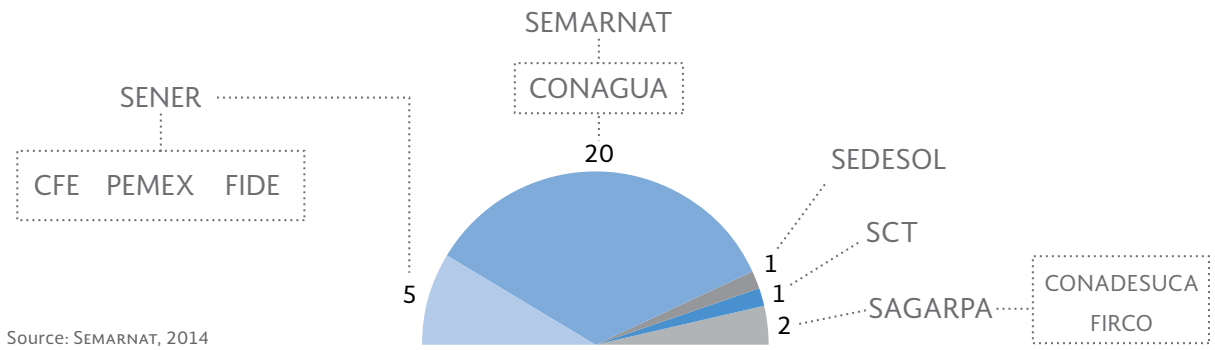
INDICATORS OF OBJECTIVE 4

Indicator
Methane emissions mitigated per year
2014 Baseline 0 Tons of methane mitigated per year
2018 Target 161,724 tons of methane per year

Indicator
Black carbon emissions mitigated per year
2014 Baseline 0 Tons of black carbon mitigated per year
2018 Target 2,157 Tons of black carbon mitigated per year

Shown below is the contribution of APF agencies to Objective 4, to its strategies and lines of action.

Figure 15. Contribution by APF agency to Objective 4



Source: Semarnat, 2014

Strategy 4.1 Use technologies and fuels that reduce the emission of black carbon and improve the quality of air and public health

This strategy seeks to promote the reduction of black carbon emissions in the oil & gas, energy generation and use, and agricultural and residential sectors by the efficient replacement and use of fuels.

4.1.1 Promote the implementation of 3 low-emission urban public transportation corridors to natural gas in Mexico. [Semarnat]

4.1.2 Estimate, monitor, and mitigate black carbon emissions resulting from the power sector activities. [Sener/Pemex/CFE]

4.1.3 Meet the domestic consumption of Ultra Low Sulfur (ULS) fuel. [Pemex]

4.1.4 Reduce black carbon emissions by avoiding the burning of sugar cane with green crops. [Sagarpa]

4.1.5 Promote retrofit projects in diesel vehicles. [Semarnat]

4.1.6 Replace traditional open stoves with wood-saving stoves in houses located in poor and marginalized areas. [Sedesol]

Strategy 4.2 Reduce methane emissions in waste water treatment plants, landfills, and in the oil and agricultural sectors

This strategy seeks to promote the reduction of methane emissions since this pollutant is considered one of the largest contributor to climate change. The action lines encourage controlled management of the emissions and leakage reduction .

4.2.1 Reduce leaks and gas venting due to the natural gas exploration, production, processing and distribution processes. [Pemex]

4.2.2 Promote a proper management of solid waste by closing down landfills, support the construction of sanitary landfills, biodigestors, and operating organisms. [Semarnat]

4.2.3 Mitigate GHG emissions by increasing the coverage of municipal waste water treatment. [Conagua]

4.2.4 Carry out closing and abandonment actions of contaminated sites with municipal and hazardous residues for methane capture. [Semarnat]

4.2.5 Develop the National Contaminated Site Remediation Program. [Semarnat]

4.2.6 Promote environmentally sustainable Technologies in agrobusiness production processes. [Sagarpa]

Waste water treatment plant. Source: Semarnat, 2012

Oil Rig, Pemex. Source: Pemex, 2013

Strategy 4.3 Control coolant (HFC) emissions with a high Global Warming Potential

This strategy seeks to expand our knowledge about the sources and types of coolants (HFCs) emitted in Mexico, as well as to promote the use of cleaner technologies that reduce the emission of this pollutant into the air.

4.3.1 Contain and destroy HFCs under FIDE's coolant substitution program. [FIDE]

4.3.2 Develop a national inventory of HFCs by substance and sector. [Semarnat]

4.3.3 Develop technologically feasible projects for commercial air conditioning, and domestic and commercial refrigerators. [Semarnat]

Strategy 4.4 Develop regulatory and promotion instruments to regulate the emission of SLCPs

This strategy considers the development, improvement, and updating of regulations and promotion programs in the oil & gas, transportation and agriculture.

4.4.1 Develop a NOM (Mexican Official Standard) on the maximum allowable limits of NOx and other polluting gases from gas turbines. [Semarnat]

4.4.2 Develop a NOM on gas and pollutant emission limits from field, pits, and elevated burners. [Semarnat]

4.4.3 Develop a NOM to reduce leaks from hydrocarbon storage tanks. [Semarnat]

4.4.4 Develop a NOM or Good Practices Guide to mitigate emissions and particles from fixed sources using biomass. [Semarnat]

4.4.5 Publish the NOM that establishes maximum allowable limits for the emission of polluting vapors from dispatching fuel in service stations. [Semarnat]

4.4.6 Update the energy and greenhouse compound efficiency norm for new light vehicles and issue an appropriate norm for heavy vehicles. [Semarnat]

4.4.7 Issue energy and greenhouse compound efficiency norms for heavy machinery, sea, railway and air transportation. [Semarnat]

4.4.8 Develop a procedure NMX to verify the efficiency of fixed-source emission on-going monitoring systems. [Semarnat]

4.4.9 Promote and regulate the use of natural gas for vehicles by updating NOM-050- SEMARNAT-1993, and NOM-047-SEMARNAT-1999. [Semarnat]

4.4.10 Issue norms on the emission of ozone depleting substances. [Semarnat]

Strategy 4.5 Promote the development of NAMAs which reduce SLCPs

This strategy proposes the development of mitigation actions which do not have now a federal budget for their definition and implementation, and therefore require technical and economic resources from national, international, public, and private sources. Their development involves deep transformations to eliminate barriers and promote a sustainable development, in addition to GHG mitigation. The development of NAMAs implies sound MRV systems and synergies in the public and private sectors.

4.5.1 Promote NAMA projects for leaks of natural gas during their transportation, production, venting, and use. [Pemex]

4.5.2 Promote NAMA projects for cooling gases for domestic and commercial refrigerators, and air conditioning. [Semarnat]

4.5.3 Promote NAMA projects for waste water treatment. [Semarnat]

4.5.4 Promote a NAMA project of federal cargo vehicle transportation for men, trucks, and small carrier [SCT]

Transportation, Mexico City. Source: GIZ, 2013

Indicators for Objective 4

INDICATOR	Methane emissions mitigated per year
General Description	The mitigation of methane emissions counts the lines of actions on urban solid residues, waste water treatment plants, biodigestors, and gas burning and venting in the hydrocarbon sector. In addition to having a significant impact on global warming as a GHG, methane is one of the precursors of ozone in the troposphere, another SLCP. Methane has a life in the atmosphere of approximately 12 years, and therefore its mitigation has short-term effects. Among SLCPs, methane is a gas with the highest amount and from which we have more information for estimations and measurements.
Observations	SLCP monitoring is an innovative element in the fight against climate change and will allow to establish mitigation policies with an immediate benefit. Additionally, monitoring this indicator will reveal new information in different sectors with a high growth rate of emissions, such as residues. The lines of action for Objectives 3 and 4 of PECC 2014-2018 were counted using calculation methodologies based on international standards certified by IPCC.
Periodicity	Annual
Source	Annual Reports of APF agencies and INECC's calculation estimations. Annual PECC 2014-2018 progress reports included SIAT-PECC.
Additional References	Unit in charge of reporting the progress of the indicator: Semarnat's Office for Climate Change Policies.
2013 Baseline	0 Tons of methane mitigated per year
2018 Target	161,724 Tons of methane mitigated per year*

* The PECC 2014-2018 also quantifies a potential mitigation of 116,667 tons of methane subject to obtaining domestic or international financial and technological resources, both public and private; if these resources are secured, this mitigation could be 278,391 tons of methane (See Methodology Attachment).

Suburban train. Source: SCT Image bank, 2013

INDICATOR	Black carbon emissions mitigated per year
General Description	Black carbon emissions quantify lines of action related to transportation, power generation and saving stoves. These particles have a short life in the atmosphere measured in hours or weeks. There is evidence that black carbon's global warming potential is very high, and it is even considered as the second most significant pollutant for climate change, after CO_2. Moreover, black carbon contributes to the reduction of albedo and has a great impact on the health of the population.
Observations	Monitoring black carbon is an innovative element in the fight against climate change which will provide information on sectors with a high growth of emissions and will allow to establish mitigation policies with an immediate benefit. The lines of action for Objectives 3 and 4 of PECC 2014-2018 were counted using calculation methodologies based on international standards.
Periodicity	Annual
Source	Annual Reports of APF agencies and INECC's calculation estimations. Annual PECC 2014-2018 progress reports included SIAT-PECC.
Additional References	National Inventory of Black Carbon Emissions under development by INECC, Supporting National Planning of Short-lived Climate Pollutants in Mexico (SNAP). Unit in charge of reporting the progress of the indicator: SEMARNAT's Office for Climate Change Policies.
2013 Baseline	0 Tons of black carbon mitigated per year
2018 Target	2,157 Tons of black carbon mitigated per year

Forest fire. Author: Fernando Reyes Pantoja, 2014

The importance of having solid and coordinated institutions, effective instruments and inclusive climate change policies

Facing climate change, both in adaptation and mitigation terms, requires solid and coordinated institutions. This is why the LGCC establishes the integration of the National Climate Change System (SINACC, in Spanish) as the institutional framework to ensure cross-cutting policies by means of an effective coordination of different level of government, the Legislative Power, and agreements among the public, private, and social sectors.

Sinacc consists of six actors that guarantee the participation of society and provide the necessary technical and scientific support to address climate change (see Figure 16).

A National climate change policy that gives positive and permanent results requires of innovative tools and instruments that are efficient and effective, and that allow to comply with the national objectives and objectives. The aggregate of instruments and tools of the National policy in this matter helps to strengthen the international climate scenario and the leadership of Mexico.

For this reason, the PECC 2014-2018 considers the development and consolidation of a number of economic, political, information, educational, research, and training instruments which require the joint participation of civil society with a gender equality approach.

Figure 16. National Climate Change System

Source: ENCC 2013. National Climate Change System Vision 10-20-40. Government of Mexico

To implement the national climate change policy the PECC 2014-2018 proposes the following objective:

OBJECTIVE 5

Consolidate the national climate change policy with efficient instruments in coordination with the states, municipalities, the Legislative Power, and the society

Policy Institutions and Instruments		Training and Information Tools and Instruments	
Economic Instruments		Global Responsibility	

Objective 5. Consolidate the National Climate Change Policy with efficient instruments in coordination with the states, municipalities, the Legislative Power, and the society

This objective contains 5 strategies and 41 lines of actions that promote the development and implementation of several institutional instruments, public policy, economic, information, training and research instruments to consolidate the national climate change policy.

Strategy 5.1	Strategy 5.2	Strategy 5.3	Strategy 5.4	Strategy 5.5
Create and consolidate institutions and instruments derived from the General ClimateChange Law	Develop and implement instruments to consolidate the national climate change policy	Develop and apply economic, financial, and fiscal instruments that facilitate implementing the national climate change policy	Enhance training, research and information models and instruments on climate change	Consolidate Mexico as a committed party with a global responsibility sense to strengthen international cooperation on climate change
9 Lines of action	8 Lines of action	10 Lines of action	10 Lines of action	4 Lines of action

INDICATORS OF OBJECTIVE 5

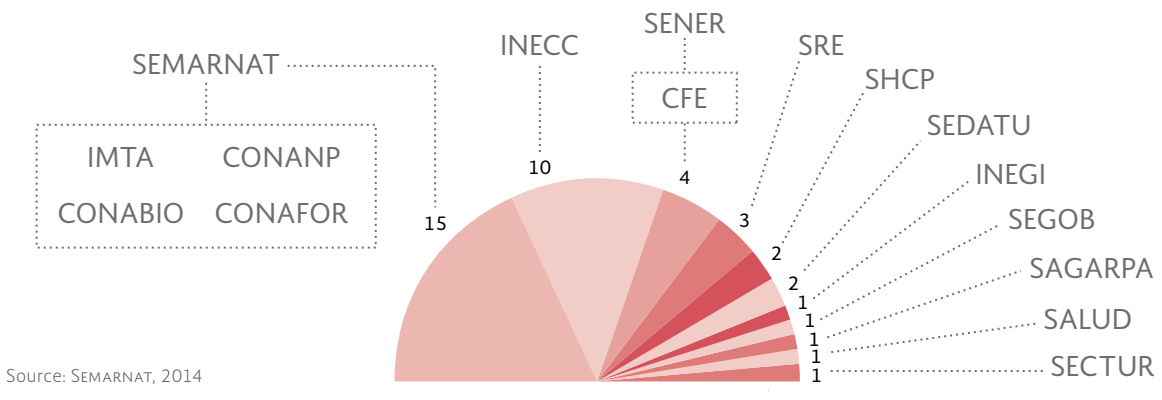
Indicator
Percentage of progress in the development of the Climate Change Information System.
2014 Baseline 0%
2018 Target 100%

Indicator
Percentage of progress in the development of the National Emission Registry.
2013 Baseline 0%
2018 Target 100%

Indicador
Number of agreements signed to support compliance with the national climate change objectives.
2014 Baseline 0%
2018 Target 32

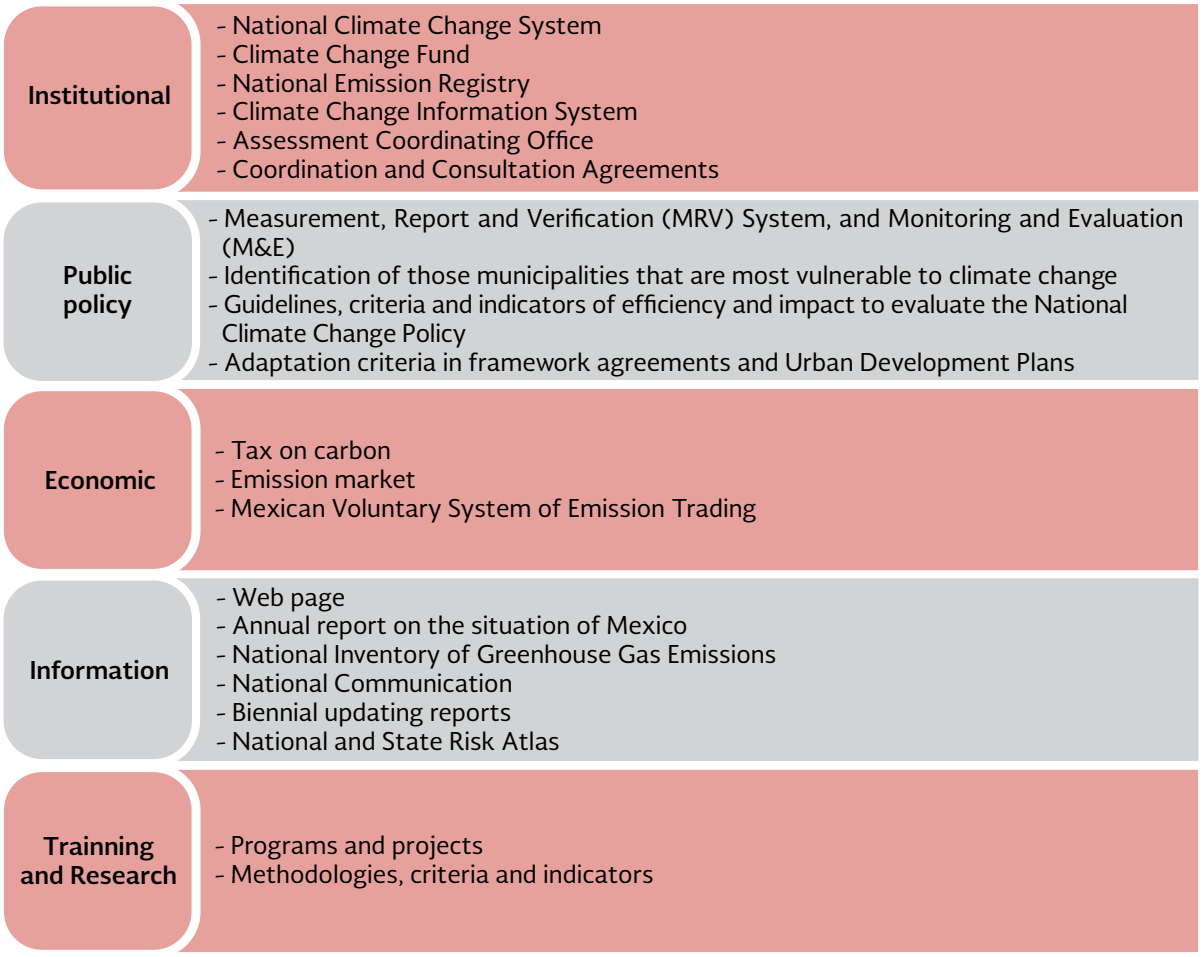
Shown below is the contribution of APF agencies to Objective Objective5, to its strategies and lines of action.

Figure 17. Contribution by APF agency to Objective 5



Source: Semarnat, 2014

Figure 18: National climate change policy instruments



General Climate Change Law

» Effective as from **October 10th, 2012.**

» **Objective:** Regulate, promote and allow the implementation of a national climate change policy, and incorporate adaptation and mitigation actions with a long-term systematic, decentralized, collaborative and integrated approach.

The established and aspiration objectives of the LGCC are:

2020 ·····→ Reduce GHG emissions by 30% with respect to the baseline

2024 ·····→ At least 35% of power generation must come from clean energy sources

2050 ·····→ Reduce GHG emissions by 50% with respect to those registered in the year 2000

·····→ Zero deforestation rate (no fixed term)

Strategy 5.1 Create and consolidate the institutions and instruments derived from the Climate Change Law

This strategy aims at consolidating the institutions and instruments established in the LGCC; chief among them is SINACC. This System will be a permanent concurrence, communication, cooperation and consultation mechanism of climate policies. Other instruments derived from the LGCC are also considered in this strategy, such as the National Emission Registry, the Climate Change Information System, and the Climate Change Fund.

5.1.1 Integrate the National Climate Change System and call its members to develop regulations and the coordination basis. [SEMARNAT]

5.1.2 Develop and consolidate the Climate Change Information System. [INEGI]

5.1.3 Operate the Climate Change Fund and other financial resources with priority, gender equity, transparence, and efficiency criteria. [SEMARNAT]

5.1.4 Establish the Assessment Coordinating Office in INECC and issue recommendations based on the results of the assessments. [INECC]

5.1.5 Issue regulations and start the operation of the National Emission Registry. [SEMARNAT]

5.1.6 Develop and manage a web page with updated and reliable climate change information. [INECC]

5.1.7 Elaborate and publish an Annual Report on the general situation of Mexico on climate change matters. [INECC/INEGI/CICC]

5.1.8 Develop guidelines, criteria and indicators of efficiency and impact to evaluate the National climate change policy. [INECC]

5.1.9 Update the National Inventory of Greenhouse Gas Emissions to support decision-making. [INECC]

Strategy 5.2 Develop and implement instruments to consolidate the national climate change policy

This strategy seeks to have the participation of federal states and municipalities, as well as of the private and social sectors to join the efforts of the PECC 2014-2018, in order to attain Mexico's objectives on climate change adaptation and mitigation matters.

5.2.1 Call the federal states to sign a framework agreement to support the compliance with the national climate change objectives. [SEMARNAT]

5.2.2 Call the social and private sectors to agree on actions that support the compliance with the national climate change objectives. [SEMARNAT]

5.2.3 Promote the development of a GHG inventory to reduce emissions in activities related to tourism. [SECTUR]

5.2.4 Develop and implement instruments that promote the consumption of sustainable goods and services in the Federal Government. [SEMARNAT]

5.2.5 Incorporate climate change adaptation criteria to state and municipal framework agreements and Urban Development Plans. [SEDATU]

5.2.6 Identify those municipalities and social groups that are most vulnerable to climate change. [INECC/SEGOB]

5.2.7 Establish and inform on the annual rating of risk degree by region and type of phenomenon. [SEGOB]

5.2.8 Implement a climate change monitoring and evaluation system, as well as adaptation actions in PNAs. [CONANP]

Strategy 5.3 Develop and use economic, financial, and fiscal instruments which facilitate implementing the national climate change policy

This strategy seeks to promote the design, implementation and enforcement of economic, fiscal, and financial instruments that promote effective and efficient actions to fight climate change and transit to a more competitive and low-carbon economy.

5.3.1 Establish taxes on fossil fuels for carbon contents and to combustion activities due to GHG emissions. [SHCP]

5.3.2 Facilitate the participation of the energy sector in international funding and promotion mechanisms for the innovation and investment in clean technology. [CFE]

5.3.3 Create an integrated economic incentive plan for PNAs in order to promote mitigation and adaptation actions. [Conanp]

5.3.4 Develop and promote the use of financial and fiscal instruments to consolidate resilient cities and prevent disasters. [Sedatu]

5.3.5 Develop strategies, programs, projects, and mechanisms that allow the participation of the productive sectors in GHG emission trade. [Cre]

5.3.6 Define models that facilitate the public sector to take part in projects to generate power with renewable energies at a federal, state, and municipal level. [Sener]

5.3.7 Recur to economic and fiscal instruments to enhance the development of renewable energy projects. [Cre]

5.3.8 Reinforce and establish risk-transference funds and financial instruments to mitigate the fiscal impact of external events, including natural disasters. [SHCP]

5.3.9 Promote mechanisms to link the Mexican Voluntary System of Emission Trading to international and local markets, such as the state of California, United States. [Semarnat]

5.3.10 Promote the link of the Mexican Voluntary System of Emission Trading to institutions like the Mexican Stock Exchange. [Semarnat]

Dome of the Mexican Stock Exchange. Author: Jesús Lazcano Notario, 2013

Strategy 5.4 Enhance training, research and information models and instruments on climate change

This strategy aims at promoting more and better information and training on climate change in Mexico. Moreover, it seeks to trigger research and technological innovation on climate change.

5.4.1 Implement training programs on climate change and forests in forest communities, including the equitable participation of men and women. [Semarnat]

5.4.2 Promote research on agriculture technologies for climate change mitigation and/or adaptation. [Sagarpa]

5.4.3 Develop research for managing and preserving water linked to climate change adaptation and mitigation. [IMTA]

5.4.4 Evaluate the impact of climate change on water resources. [IMTA]

5.4.5 Develop methodologies and indicators to enhance capacities at a local level to reduce the vulnerability of water systems to climate change. [IMTA]

5.4.6 Design a geospatial data automated processing system to follow changes in the use of land. [Conabio]

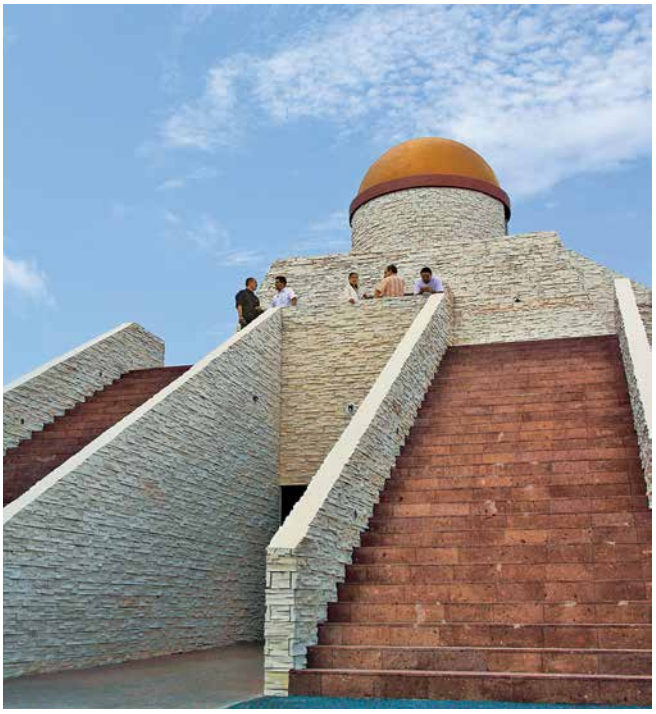
5.4.7 Propose educational contents in books, school books and educational material on climate change to the National Educational System. [INECC]

5.4.8 Establish institutional support capacities to adopt and develop climate technologies. [INECC]

5.4.9 Enhance the environmental Sector Fund in CONACYT under the research priorities on climate change at a national, regional and local level. [INECC]

5.4.10 Have a assessment to assess vulnerability to climate change in the health care system. [Salud]

National Laboratory Sciences for Sustainability. Source : Semarnat, 2014



Climate Education Center Cancun. Source : Semarnat, 2014

Strategy 5.5 Consolidate Mexico as a committed party with a global responsibility sense to strengthen international cooperation on climate change

This strategy aims at keeping Mexico's leadership as a responsible and active party to the global climate agenda.

5.5.1 Promote the strengthening of international cooperation on climate change matters. [SRE]

5.5.2 Contribute to the definition of an international legal and institutional framework on climate change beyond 2015. [SRE]

5.5.3 Maintain and enhance relations to non-governmental parties relevant to enrich Mexico's position in the international climate change scenario. [SRE]

5.5.4 Develop National Biennial Updating and Communications Reports to the UN Framework Convention on Climate Change. [INECC]

COP 16 Cancun. Source Semarnat, 2010

Indicators for Objective 5

INDICATOR	Percentage of progress in the development of the Climate Change Information System
General Description	This indicator measures the degree of progress in the development and consolidation of the Climate Change Information System.
Observations	Progress will be measured considering the compliance with the programmed actions for the development and consolidation of the Climate Change Information System.
Periodicity	Annual
Source	National Institute of Statistics and Geography and National Institute of Ecology and Climate Change: Acts and documents issued by the Technical Specialized Committee on Climate Change Information (CTEICC, in Spanish).
Additional references	Under the LGCC, this System will concentrate relevant information on Mexico's climate physical conditions, as well as on GHG emissions and reduction. This information will be useful for decision-making in the public sector and a significant tool for the social and private sectors. Unit in charge of reporting the progress of the indicator: Semarnat's Office for Climate Change Policies.
2014 Baseline	0%
2018 Target	100%

INDICATOR	Percentage of progress in the development of the National Emission Registry
General Description	This indicator measures the progress made on the development and operation of the National Emission Registry.
Observations	Progress will be measures according to the compliance with the actions established by Semarnat for the development and start of operations of the National Emission Registry.
Periodicity	Annual
Source	Official Gazette of the Federation, Ministry of the Environment and Natural Resources: Web page of the National Emission Registry.
Additional references	According to the LGCC the National Emission Registry shall include information on the establishments subject to reporting under the applicable regulations. It will also include emission reduction projects that are voluntarily recorded in the Registry. Unit in charge of reporting the progress of the indicator: Semarnat's Office for Climate Change Policies.
2014 Baseline	0%
2018 Target	100%

INDICATOR	Number of agreements signed to support compliance with the national climate change objectives
General Description	This indicator measures progress in the number of agreements signed by federal states, and the social and private sectors to support the compliance with national climate change objectives.
Observations	Number of signed agreements (state, private and social sectors).
Periodicity	Annual
Source	Ministry of the Environment and Natural Resources PECC 2014-2018 progress reports published.
Additional references	Under the Planning Law and the LGCC the Federal Government may execute agreements with the states, the private and social sectors to coordinate or agree on actions to address climate change. Unit in charge of reporting the progress of the indicator: SEMARNAT's Office for Climate Change Policies.
2014 Baseline	0
2018 Target	32

Gender and Climate Change

The effects of climate change in Mexico are different due to the economic, social, and political inequalities among regions, social groups, as well as between women and men. Therefore, the vulnerability, adaptation capacity, and resilience to climate change is different.

The vulnerability faced by women to disasters differs according to the roles they perform and the areas in which they develop. Natural disasters have a greater impact on women's life expectancy, as they are 14 times more likely to die as a result of disasters.[38]

Promoting gender equity and the participation of women, as well as their access, use, control, and management of natural resources, and placing them as main parties to decision-making in order to improve their position as regards the conservation, preservation and use of natural resources is essential to address successfully the challenge imposed by climate change as a society.

The lines of action of PECC 2014-2018 that address directly the gender approach are:

1.1.2 Consolidate the National Risk Atlas incorporating gender indicators. [Segob]

1.2.3 Promote the creation of civil protection committees in disaster risk areas, with the participation of women of all ages. [Segob]

2.2.4 Apply instruments for the sustainable management of biodiversity in priority areas of CBMM and promote equal opportunities for men and women. [Conabio]

2.3.6 Promote sustainable community tourism projects, with a gender perspective in PNAs and/or vulnerable areas. [Sectur]

5.1.3 Operate the Climate Change Fund and other financial resources with priority, gender equity, transparence, and efficiency criteria. [Semarnat]

5.4.1 Implement training programs on climate change and forests in forest communities, including the equitable participation of men and women. [Conafor]

Moreover, the PECC 2014-2018 is aligned to the lines of action of the **National Program for Equal Opportunities and Non-discrimination against Women, PROIGUALDAD 2013-2018**, and of the **Program for a Democratic Productivity 2013-2018** listed in Attachment III.

Reforestation campaign in the State of Mexico. Source: Semarnat, 2011

[38] National Program for Equal Opportunities and Non-discrimination against Women, Proigualdad 2013-2018

Social Participation and Transparency

Section 68 of the LGCC sets forth that to elaborate the PECC 2014-2018 the CICC, in coordination with the Climate Change Board, will promote the participation of society. Likewise, Section 110, paragraph I establishes that the Commission shall call to social and private sector organizations to expose their opinions and proposals on climate change adaptation and mitigation.

To address this mandate, from September to November 2013 the CICC, through Semarnat, conducted two workshops with several members of the civil society. From the results obtained in these workshops a survey was developed to prioritize the recommendations from the civil society. This survey was on line at Semarnat's portal for 15 days and had more than 700 participants.

In cooperation with the Climate Change Board two specialized workshop took place, one with the academia and the other with the private sector. Both workshops exposed subject of interests for these sectors related to PECC 2014-2018 and have incorporated their recommendations and proposals.

The feedback obtained from these citizen participation exercises helped in developing this Program are is reflected in their Objectives, Strategies, and Lines of Action.

The electronic version of PECC 2014-2018 is available in the section "Programs of the National Development Plan" on: www.hacienda.gob.mx and in the tab Transparency on: www.semarnat.gob.mx. The follow-up of these indicators will be available on www.transparenciapresupuestaria.gob.mx

The annual progress of PECC 2014-2018 according to the objectives, indicators and objectives defined herein will be available on Semarnat's portal.

Social participation workshop to develop PECC 2014-2018. Author: Camilo de la Garza, 2013

Final Considerations

The PECC 2014-2018 represents a -cutting policies effort and a joint work of a considerable amount of government agencies to address climate change challenges. To reach the aspiration objectives set forth in the LGCC, the PECC shall be complemented with actions carried out by the states, municipalities, the private sector and society at large. The decisive and joint participation of all Mexicans will result in building a resilient country and move towards a competitive and low-emission economy.

A punctual follow-up of PECC 2014-2018 is crucial to ensure that its objectives are attained. It is by means of a solid and on-going monitoring that the integrity, consistency, transparency, and accuracy of its progress may be guaranteed. The Program considers a follow-up mechanism called SIAT-PECC. It consists of a platform that allows each responsible agency to report independently the annual progress of its lines of action.

Each line of action has technical information with data on its estimated budget, the baseline and target to 2018, as well as the agency and unit in charge of its compliance. This information will be recorded in the SIAT-PECC and updated regularly to be included in the progress report.

The annual SIAT-PECC reports will be confirmed and validated by the respective agency within the frame of CICC's Work Group created for this purpose (GT-PECC, in Spanish). The annual estimation in the progress of PECC 2014-2018 will be reported by Semarnat and published in the first two month period of each year on its web page: http://www.semarnat.gob.mx.

The PECC 2014-2018 will be evaluated systematically by INECC'S Assessment Coordinating Office to adjust and modify it as necessary, thus ensuring a wider and better compliance with its objectives. Such evaluation will be carried out under Sections 101 and 102 of the LGCC, and the results will be published in the Official Gazette of the Federation and delivered to the Deputy and Senator Chambers of the Congress of the Union.

Glossary

Adaptation
The measures and adjustments in human or natural resources as a response to climate events, whether forecast or real, or to their effects that may moderate the damages or benefit from their positive aspects.

Biodiversity
The variability of living organisms from any source, including, among others, land and sea ecosystems, as well as other water ecosystems and the ecological complexes to which they belong. It includes the diversity of each species, among species and the diversity of ecosystems.

Biofuel
Fuel produced from organic matter or vegetable combustible oils. Alcohol, black liquor derived from paper manufacturing, wood, or soy oil are biofuels.

Biological corridor
Geographical path that allows the exchange and migration of flora and fauna species within one or more ecosystems. Their function is maintaining the connectivity of biological processes to avoid the isolation of populations.

Biomass
Any organic matter of biological origin derived from animals and plants as a result of the photosynthetic conversion process.

Carbon dioxide (CO_2)
Gas that exists spontaneously and also as a byproduct of burning fossil fuels coming from fossil carbon deposits, such as oil, gas, or coal; from burning biomass, or from changes in the use of land and other industrial processes.

Climate change
Variation in climate attributed directly or indirectly to human activity which alters the global atmospheric composition and is added to the natural variability of the climate observed during comparable periods of time.

Co-generation
Production of power jointly with steam or other type of secondary thermal energy, or both.

Deforestation
Loss of forest vegetation due to causes that may be induced or natural, as well as due to any other condition.

Degradation
Process of decrease in the capacity of forest ecosystems to provide environmental services, as well as productive capacity.

Disaster
Result from the occurrence of one or more severe or extreme disturbing agents, whether connected or not, natural or induced by human activity which when taking place in a certain time and area cause damages, and that due to their magnitude exceed the response capacity of the affected community.

Ecological management
Environmental policy instrument to regulate or induce the use of land and production activities, so as to protect the environment, and preserve and use natural resources in a sustainable manner based on an analysis of the deterioration trends and the potentiality of use of such resources.

Ecosystem
Basic interaction functional unit of living organisms among themselves, and of organisms with the environment in a certain space and time.

Emissions
Release into the atmosphere of greenhouse gases and/or their precursors and aerosols into the atmosphere, including, if applicable, greenhouse compounds, in a specific area and period of time.

Energy efficiency
Quotient between the useful energy produced by a system, a conversion process or activity, and the energy input.

Environmental services
Tangible and intangible benefits generated by ecosystems necessary for the survival of the natural and biological system as a whole, and to provide benefits to human beings.

Exotic invading species
Exotic species established in natural or semi-natural habitats or ecosystems outside its natural distribution. It is an agent of change and represents a threat to native biodiversity.

Exposure
The nature and degree to which a system is exposed to considerable climate variations.

External factors
Positive or negative impacts generated by providing a good or service and that affect or might affect third parties. External factors take place when the cost paid for a good or service is different to the total cost of damages and benefits in economic, social, environmental and health terms and that involve production and consumption.

Extreme weather phenomenon
A value of a weather or climate variable that is registered above (or below) a threshold value close to the higher (or lower) end of a series of values observed in the variable.

Green jobs
Persons performing any kind of economic activity which generates goods or services and benefit the environment or use natural resources in a sustainable manner.

Greenhouse gases (GHG)
Gas components of the atmosphere, both natural and human-induced, that absorbs and emits infrared radiation.

Infrastructure
Works made by man to meet or provide a service.

Integrated risk management
Set of actions oriented to identify, analyze, assess, control and reduce risks considering their multifactorial origin and in a constant process of development involving the three levels of government, as well as the different sectors of society, which facilitates carrying out actions directed to create and implement public policies, strategies and procedures integrated to achieving sustainable development guidelines, fight the structural causes of disasters and enhance the society's resilience or resistance capacities. It involves the following stages: Identification of risks and/or their formation, prevision, prevention, mitigation, preparation, aid, recovery, and reconstruction process.

Low-carbon economy
Group of productive and exchange activities that disassociates economic growth from the rise in GHGs, which allows for a sustainable and socially inclusive growth. It does not represent a hindrance to development, but a change in the forms of production, generation and use of energy to reduce polluting emissions.

Mitigation
Enforcement of policies and actions aimed at reducing the emissions of sources, or improve the sinks of greenhouse compounds and gases.

Radiative forcing
Change in the net vertical irradiation expressed in W/m^2 in the tropopause due to an internal change or to a change in the external forcing of the climate system (i.e., a variation in the concentration of carbon dioxide or the power of the sun).

Reforestation
Human-induced implantation of forest vegetation in forest areas.

Resilience
Capacity of natural or social systems to recover or resist the effects resulting from climate change.

Resistance
Capacity of natural or social systems to persist to the effects resulting from climate change.

Restoration
Group of activities aimed at recovering and reestablishing those conditions that propitiate the evolution and continuity of natural processes.

Risk atlas
Dynamic document whose risk evaluations in vulnerable regions or areas consider current and future climate scenarios.

Risk
Probability that a damage is caused to persons in one or several ecosystems as a result of a natural or a human-induced phenomenon.

Self-supply
The supply of power requirements of the members of private citizens with their own power station. As a modality defined by the Energy Regulating Commission it is understood as: The generation of power for self-consumption purposes, provided such energy is destined to meet the requirements of individuals or corporations and is not inconvenient for the nation.

Short-lived Climate Pollutants (SLCPs)
Substances such as methane, black carbon, tropospheric ozone, and several HFCs that have a significant short-term impact on climate change and have a relatively short life in the atmosphere, as compared to carbon dioxide and other gases.

Sink
Any process, activity, or mechanism that detracts from the atmosphere a greenhouse gas, an aerosol, or any of its precursors.

Sustainable development
The assessable process by criteria and indicators of environmental, economic, and social character which tends to improve the quality of life and the productivity of persons based on adequate ecological balance preservation, environmental protection and use of natural resources, so that meeting the needs of future generations is not compromised.

Sustainable use
The use of natural resources in such a way that it meets the full functionality and load capacity of ecosystems in which such resources are part of for indefinite periods of time.

Tons of equivalent carbon dioxide
Unit of measure of GHGs expressed in tons of carbon dioxide that would have an equivalent greenhouse effect.

Vulnerability
Level at which a system is susceptible, or is not capable of handling the adverse effects of Climate Change, including climate variability and extreme phenomena. Vulnerability depends on the nature, magnitude, and speed of climate variation to which a system is exposed, its sensitivity and adaptation capacity.

Wastewaters
with varied composition coming from the discharge of urban, domestic, industrial, commercial, service, agricultural, livestock, treatment plants waters, and generally from any other use, as well as any mixture thereof.

Acronyms

APF	Public Federal Administration
Banobras	Nacional Bank of Public Works and Services
CBMM	Mesoamerican Biological Corridor - Mexico
CCAC	Climate and Clean Air Coalition
CCUS	Carbon Capture, Use and Storage
Cenapred	National Disaster Prevention Center
CFE	Federal Electricity Commission
CH_4	Methane
CICC	Intersecretarial Climate Change Commission
CN	Black carbon
CO	Carbon monoxide
CO_2	Carbon dioxide
Conabio	National Commission for the Knowledge and Use of Biodiversity
Conafor	National Forest Commission
Conagua	National Waters Commission
Conanp	National Commission of Protected Natural Areas
Conuee	National Commission for the Efficient Use of Energy
CRE	Energy Regulatory Commission
DGPCC	Climate Change Policies Office
ENAPROC	Civil Protection National School
ENCC	National Climate Change System
Fide	Trust for Power Savings
Fonden	Natural Disasters Fund
Fopreden	Fund for the Prevention of Natural Disasters
GDP	Gross Domestic Product
GHG	Greenhouse gases
GWP	Global Warming Potential
HFCs	Hydrofluorocarbons
IMTA	Mexican Institute of Water Technology
INECC	National Institute of Ecology and Climate Change
INEGEI	National Inventory of Greenhouse Gas Emissions
Inegi	National Institute of Statistics and Geography
Inmujeres	National Institute of Women
LGCC	General Climate Change Law
LGEEPA	General Law for Ecological Balance and Environmental Protection
Mipymes	Micro, Small, and Medium-sized Companies
NAMA	Nationally Appropriated Mitigation Actions
NMX	Mexican Norms
NOM	Mexican Official Norm
NOx	Nitrogen oxides
Pemex	Petróleos Mexicanos
PNA	Protected Natural Area
PND	National Development Plan
PNPC	National Civil Protection Program
Profeco	Federal Consumer Protection Agency

Promarnat	Sector Program of the Ministry of the Environment and Natural Resources
REDD+	Reduction of Emissions due to Forest Deforestation and Degradation
Sagarpa	Ministry of Agriculture, Livestock, Rural Development, Fisheries and Food
SALUD	Health Care Ministry
SCT	Ministry of Communications and Transportation
SE	Ministry of Economy
Sectur	Ministry of Tourism
Sedatu	Ministry of Agrarian, Territory and Urban Development
Sedena	Ministry of Defense
Sedesol	Ministry of Social Development
Segob	State Department
Semar	Ministry of the Navy
Semarnat	Ministry of the Environment and Natural Resources
Sener	Ministry of Energy
SEP	Ministry of Public Education
SFNA	Environmental Promotion and Normativity Subsecretary's Office
SGPA	Environmental Protection Management Subsecretary's Office
SHCP	Ministry of the Treasury and Public Credit
SIAT-PECC	IInformation System of the Cross-cutting policies Agenda
Sinacc	National Climate Change System
SLCP	Short-lived Climate Pollutants
SMN	National Meteorological Service
SRE	Ministry of Foreign Affairs
TCO_2e	Tons of equivalent carbon dioxide
TSUGIR	University Technician in Integrated Risk Management
USCUSS	Use of Soil, Change of Use of Land, and Forestry

Attachment I. Supplementary Activities of Agencies

In addition to its Objectives, Strategies and Lines of Action this Program has a list of supplementary activities incorporated to this Attachment, since APF's agencies and entities have also identified these activities as relevant to implement the national climate change policy.

Climate change training activities

1. Develop a training program for the personnel and institutions of the health-care system given the threats posed by climate change. [Salud]
2. Provide training on adaptation and mitigation through CICC. [Semarnat]

Climate change education activities

3. Design the online subject "Climate change and adaptation measures" for TSUGIR's career in ENAPROC. [Segob]
4. Carry out Profeco's education and dissemination campaigns and programs to promote a sustainable consumption. [SE]
5. Enhance the drill program to contain hydrocarbon spills.[Semar]
6. Create the scholarship "Excellence in Contributions to your Environment." [SEP]
7. Design and implement in municipalities an educational communication strategy on the effects of climate change on health with a gender approach. [Salud]
8. Use massive education and communication instruments to develop a culture of sustainability and use of renewable energies. [Sener]
9. Promote a wide campaign of education on preventive culture, with an emphasis made on the population. [Segob]

Climate change research activities

10. Develop applied research projects on mitigation and adaptation in transportation and communications infrastructure. [SCT]

Climate change information activities

11. Create a national geo-referenced oceanographic information file with access to the national oceanographic research institutions. [Semar]

Financial activities for climate change

12. Establish mechanisms to promote the participation of the private sector and of the users of environmental services for the improvement and conservation thereof. [Conafor]
13. Promote a greater certainty in the agrifood activity by means of risk management mechanisms. [Sagarpa]
14. Use and benefit from Pemex's donation system to strengthen the planning system at a municipal level. [Sener]
15. Develop new financial instruments to widen the number of people subject to loans in self-supply projects using renewable energy sources. [Sener]
16. Enhance risk management models of the federal government against natural disasters under a risk prevention approach and an adequate coordination between federal and state agencies. [SHCP]

Activities to reinforce public policy instruments on climate change matters

17. Propose the alignment of the Regulations to LGEEPA on Environmental Impact to LGCC, incorporating climate change criteria. [Semarnat]
18. Update guides on works and activities requiring an environmental impact authorization with climate change criteria. [Semarnat]
19. Design and promote a Guide for climate change adaptation and mitigation for the tourist sector. [Sectur]
20. Establish guidelines and criteria for climate vulnerability studies of Mexico across all sectors. [INECC]
21. Design climate change adaptation criteria for the territory management instruments. [INECC]
22. Consolidate an Inter-sector Work Group to assess the actions of the health-care system on climate change. [Salud]
23. Establish a joint policy with state and municipal governments for the management of solid residues. [Sedatu]
24. Identify and catalog the types of interventions by area with high-risk potential and by competence of the urban and housing sector. [Sedatu]
25. Incorporate the health-care component with a gender approach to state climate change plans. [Salud]
26. Enhance the response capacity of local governments to disasters. [Segob]
27. Strengthen the civil protection legal framework homologating federal, state, and municipal regulations and the Mexican Official Norms. [Segob]
28. Stimulate the joint participation of non-governmental parties in the national climate change policy. [Semarnat]
29. Reinforce the participation of society in climate change actions through consulting boards and the Resilient Mexico Alliance. [Conanp]
30. Strengthen the Geographical Information System for EIA. [Semarnat]
31. Issue climate change criteria to develop national and state risk atlas. [INECC]

Attachment II. Table of PECC 2014-2018 Indicators

OBJECTIVE 1
Reduce the vulnerability of the population and production sectors, and increase their resilience and resistance of strategic infrastructure.

Indicator 1
Percentage of progress in the development of instruments which contribute to reducing the vulnerability of the population and of the country's productive sectors.

This indicator measures the progress in the development/updating/consolidation of assessment instruments of vulnerability or of national early alert systems by APF sector.

2014 Baseline
NA

2018 Target
100

Indicator 2
Percentage of surface under Territory Ecological Management Programs (POET, in Spanish), or developed Urban Development Programs that include strategies or criteria on climate change mitigation or adaptation.

Percentage of the Mexican territory surface that has an Ecological Management Program or an Urban Development Program that incorporates strategies and/or criteria on climate change mitigation and/or adaptation.

2013 Baseline
33%

2018 Target
75%

OBJECTIVE 2
Preserve, restore, and manage ecosystems in a sustainable manner ensuring their environmental services for climate change mitigation and adaptation.

Indicator 3
Vulnerability Decline Index by means of infrastructure and actions for the preservation, restoration and sustainable management of the natural capital.

This index groups a series of variables that reflect the actions of this sector to preserve, restore, and manage in a sustainable manner the natural capital, as well as the development and improvement of the associated infrastructure and help in protecting the population.

2013 Baseline
0.2

2018 Target
0.6

OBJECTIVE 3
Reduce GHG emissions to orient Mexico towards a competitive economy and a development with low emissions.

Indicator 4
Million annual tons of equivalent CO_2 ($MtCO_2e$) mitigated by PECC 2014-2018 and calculated with a 100 and 20-year Global Warming Potential (GWP100 and GWP20).

This indicator represents a basis to monitor reductions from actions undertaken by APF for which it is possible to calculate mitigation with a higher certainty.

2013 Baseline
0 $MtCO_2e$ mitigated

2018 Target
83.2 $MtCO_2e$-(PCG100) /year mitigated*
95.97 $MtCO_2e$-(GWP20) /year mitigated

* Furthermore, the PECC 2014-2018 quantifies the potential mitigation of 9.4 $MtCO_2e$-GWP 100 (18.9 $MtCO_2e$-GWP20) of NAMA's 5 lines of action subject to obtaining domestic or international financial and technological support, whether public or private.

Indicator 5
Tons of equivalent CO_2 emitted per MW hour generated (tCO_2e/MWh)

It is an indicator of the carbon footprint intensity in the generation of power, as it reflects the effective incorporation of renewable energies, clean technologies, and change of fuels with less carbon intensive sources in the public supply of power.

2013 Baseline
0.456 tCO_2/MWh

2018 Target
0.350 tCO_2/MWh

OBJECTIVE 4
Reduce short-lived climate pollutant emissions, promoting side benefits for the health and well-being.

Indicator 6
Methane emissions mitigated per year

SLCP monitoring is an innovative element in the fight against climate change. For the PECC 2014-2018 the priority will be reduce SLCPs, such as methane, which has an atmospheric life of approximately 12 years.

2013 Baseline
tons of methane mitigated per year

2018 Target
161,724 tons of methane per year*

* *The PECC 2014-2018 also quantifies the potential mitigation of 116,667 tons of methane subject to securing national or international financial and technological resources, both public and private, which if they are obtained could increase mitigation to 278,391 tons of methane.

Indicator 7
Black carbon emissions mitigated per year

Black carbon monitoring is an innovative element in the fight against climate change. According to recent research, black carbon would be the second chemical agent of interest for climate change after CO_2, as its particles warm the atmosphere in a 20-year period up to 3,200 times more than CO_2.

2013 Baseline
0 Tons of black carbon mitigated per year

2018 Baseline
2,157 Tons of black carbon mitigated per year

OBJECTIVE 5
Consolidate the national climate change policy with efficient instruments in coordination with the states, municipalities, the Legislative Power, and the society.

Indicator 8
Percentage of progress in the development of the Climate Change Information System.

This indicator measures the degree of progress in the development and consolidation of the Climate Change Information System.

2014 Baseline
0%

2018 Target
100%

Indicator 9
Percentage of progress in the development of the National Emission Registry.

This indicator measures the progress made on the development and operation of the National Emission Registry.

2013 Baseline
0%

2018 Target
100%

Indicator 10
Number of agreements signed to support compliance with the national climate change objectives.

This indicator measures progress in the number of agreements signed by federal states, and the social and private sectors to support the compliance with national climate change objectives.

2014 Baseline
0

2018 Target
32

Attachment III

National Program for Equal Opportunities and Non-discrimination against Women, PROIGUALDAD 2013-2018

Crosscutting Goal 1: Attain the substantial equality between women and men, and promote a respectful cultural change of women's rights

Strategies	Lines of action	
Strategy 1.1. Harmonize Mexico's legislation with the international conventions and treaties on the human rights of women under Section 1 of the Mexican Constitution.	1.1.6	Harmonize the rights of women with the Agreement on Biological Diversity.
	1.1.7	Promote harmonization of the rights of women with UN Framework Convention to Combat Desertification.
	1.1.8	Promote the harmonization of women's rights with the UN Framework Convention on Climate Change.
Promote an efficient and sustainable management of the natural capital and improve the protection of Mexico's environment.	1.4.6	Increase the participation of women in the definition, performance, and evaluation of programs and projects from which they derive benefits.

Crosscutting Goal 3: Promote access of women to a remunerated job, a proper employment and productive resources within a framework of equality

Strategies	Lines of action	
Strategy 3.4. Promote access of women to land, water, technology, and market information property for productive purposes.	3.4.3	Undertake affirmative actions to increase the participation of rural women in basic food production projects.
	3.4.5	Support production, tourist, and environmental conservation projects, particularly for indigenous women and the rural sector.
	3.4.7	Stimulate the access of women to financing in indigenous communities.
	3.4.9	Promote the access of women to water resources.

Crosscutting Goal 4: Establish specific public policies that enhance productivity in regions and sectors of the economy.

Strategies	Lines of action	
Strategy 4.1. Enhance the development of capacities in homes supported by women to improve their health, housing and income conditions.	4.1.1	Incorporate backyard economy alternatives for women that are household heads, mainly indigenous, rural and low-income women.
	4.1.9	Design mixed self-construction alternatives for women head of households with social responsibility companies.
Strategy 4.3. Improve the access of women to property of dwellings.	4.3.2	Support housing self-construction alternatives for women.
	4.3.7	Carry out affirmative actions, so that women victims of natural disasters that are reincorporated, disabled or seniors may return to their homes, or regularize of buy a property.
Strategy 4.6. Reinforce the capacity of women residing in municipalities in the campaign against hunger.	4.6.4	Promote housing self-construction programs and property titles for low-income women.
	4.6.5	Consolidate basic electricity and sewage infrastructure programs that benefit women in highly marginalized areas.

Crosscutting Goal 5: Generate safe and friendly environments for family and social activities, spare time activities, and a safe mobility for women and girls.	
Strategies	**Lines of action**
Strategy 5.2. Incorporate gender to risk detection and reduction, attention to emergencies and reconstruction of natural and human-induced disasters.	5.2.1 Identify social gender vulnerability factors in the prevention of and attention to risks in the event of natural and human-induced disasters. 5.2.2 Incorporate cultural and gender elements associated to the use of land resources in communities hit by disasters. 5.2.3 Incorporate the needs and risks of women and girls to the design of evacuation plans. 5.2.4 Incorporate gender perspectives to civil protection programs. 5.2.5 Promote the creation of civil protection committees in disaster risk areas, with the participation of women of all ages. 5.2.6 Ensure the integrity and humans rights of women and girls in shelters and refuges of persons hit by disasters. 5.2.7 Respect the right of dignity of women during evacuation, attention and emergency events.
Strategy 5.3. Promote a safe mobility of women and girls encouraging improvements to the environment and transportation.	5.3.2 Promote the construction, conservation and remodeling of public spaces with proper and safe conditions for women and children.
Strategy 5.4. Promote constructions and improvements to public spaces ensuring the safety of women, family life, and recreation.	5.4.1 Promote compact urban designs with gender perspectives to foster reconciliation, family life, joint responsibility and recreation. 5.4.3 Strengthen the coordination and cooperation among the three levels of government and the society for a safe mobility.
Strategy 5.5. Incorporate gender approaches to environmental and sustainability policies, including a legal framework on environmental issues.	5.5.1 Incorporate gender approaches to the National Climate Change. 5.5.2 Align and coordinate federal programs and induce an inclusive green growth with an intercultural and gender approach. 5.5.3 IIncorporate civil organizations to the sustainable ecological management, development and use of natural resources with a gender perspective. 5.5.5 Promote programs that tend to reduce gender gaps as regards the access, and use of natural resources. 5.5.6 Promote gender equality in the use and sustainability of natural resources: water, fishing, agriculture, livestock, renewable energies. 5.5.7 Promote sustainable fishing and fishery activities for women in coastal and river areas. 5.5.8 Promote the clearing and supply of water for human consumption and household use in rural areas where women supply themselves of water. 5.5.9 Guarantee that financial instruments for the mitigation, adaptation and reduction of vulnerability have an equitable benefit for women and girls. 5.5.10 Promote a climate change information system that generates data and indicators broken down by sex.
Crosscutting Goal 6: Incorporate gender equality policies in the three levels of government and strengthening institutionalization	
Strategies	**Lines of action**
Strategy 6.5. Guide and promote the institutional capacities to meet the National Policy on Equality between Women and Men	6.5.7 Promote technical cooperation in the international arena to exchange of knowledge and best practices of gender. 6.5.8 Strengthen Mexico 's international presence in forums, agencies and mechanisms linked to gender.

Productivity Democratization Program 2013-2018

Objective 1: Promote the efficient use and allocation of the economy's production factors

Strategies	Lines of action	
Strategy 1.2. Promote the flow of capital and funding to those projects and activities with a production growth potential.	1.2.3	Generate and promote financial instruments to support projects that contribute to Mexico's green growth.
	1.2.4	Generate financial instruments according to the needs and capacities of the agricultural production units.
Strategy 1.3. Promote the efficient use of the national territory, both in the cities and in rural areas.	1.3.1	Grant legal certainty to land use and property.
	1.3.3	Move towards a sustainable urban development model.
	1.3.4	Promote a territory management in urban areas, as well as the development of more competitive cities.
	1.3.5	Lead the general ecological management process of the territory and support regional and local management processes.
Strategy 1.4. Promote an efficient and sustainable management of the natural capital and improve the protection of Mexico's environment.	1.4.1	Promote green growth to preserve Mexico's natural capital, and at the same time promote a higher productivity.
	1.4.2	Strengthen the climate change and environmental policy to build a competitive, sustainable economy with a better resilience and low emissions of carbon.
	1.4.3	Set prices and rates that reflect the economic cost of water and promotes its conservation and efficient use.
	1.4.4	Modernize and expand the hydro-agricultural infrastructure that allow the ration and efficient use of water.
	1.4.5	Set prices and rates of energy sources that consider their environmental external factors and promote an efficient use.
	1.4.6	Promote a higher use of clean energies.

Goal 2: Enhance the productivity of workers, companies and manufacturers in Mexico

Strategies	Lines of action	
Strategy 2.3. Promote the productive and technological venturing and scaling of companies with special attention to Micro, Small, and Medium-sized Companies (MIPyMES).	2.3.8	Promote the development of suppliers and new industrial activities related to the power and hydrocarbon sectors.
	2.3.10	Promote a better environmental performance of MIPyMES, as well as the consumption of the certified environmental goods and services they offer.
Strategy 2.4. Establish comprehensive programs geared to enhancing the productivity of rural producers, particularly of small producers.	2.4.2	Promote investments in the infrastructure required to streamline commercialization and access to markets.
	2.4.4	Establish public policies designed for small agricultural producers, particularly those living in marginalized areas.

Goal 3: Improve the business environment in which Mexican companies and producers operate	
Strategies	**Lines of action**
Strategy 3.4. Enhance efficiency in the production sectors of key raw material to cut down the costs in which companies and producers have to incur.	3.4.2 Increase the operating efficiency of Pemex and CFE. 3.4.3 Ensure the feasibility of a timely quality energy supply at competitive prices along the production chain. 3.4.4 Ensure the feasibility of crude oil, natural gas and petrochemical supply to the production sector.
Strategy 3.5. Promote investments in physical and logistic infrastructure to reduce the operating costs of companies.	3.5.1 Strengthen the transportation infrastructure and improve their connectivity in a manner consistent with the requirements of the production sector. 3.5.2 Promote the multimodality for an efficient transportation of goods according to the distances and characteristics of the cargo. 3.5.3 Foster the development of advanced logistics that provides connectivity to those centers that will form the National System of Logistic Platforms. 3.5.5 Promote the use of Smart Transportation Systems to improve safety and streamline the movement of cargo and passengers. 3.5.7 Modernize and expand the network of rural roads and interstate highways. 3.5.8 Modernize and expand the hydro-agricultural infrastructure.

Goal 4: Establish specific public policies that enhance productivity in regions and sectors of the economy	
Strategies	**Lines of action**
Strategy 4.1. Promote a balanced regional development that makes the best use of the comparative advantages of each region.	4.1.5 Keep and maintain in good conditions rural roads in the most marginalized areas of Mexico. 4.1.6 Develop infrastructure that favors logistic integration and enhances regional productivity. 4.1.7 Promote a policy in seas and coastlines that fosters competitiveness and address climate change effects.
Strategy 4.2. Promote an orderly structural change that allows the growth of higher productivity activities, as well as the transformation of traditional sectors.	4. 2.3 Conduct agriculture programs to activities that enhance farming productivity, particularly of small producers. 4.2.6 Promote the development of tourism, particularly in those areas in which productivity is low. 4.2.7 Promote investments in infrastructure according to the specific needs of the priority sectors of the economy. 4.2.8 Promote the creation of high-productivity green jobs.

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